***Measuring Success:***

*How the Robin Hood Foundation Estimates the Impact of Grants*

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Table of Contents

**Section 1: Introduction**

Robin Hood's sole mission is to fight poverty in New York City. Toward that single goal, Robin Hood will make over 200 grants, totaling $138 million, to community-based organizations in 2007. Along with cash grants, we provide grantees technical assistance, otherwise called management-assistance, which includes helping grantees develop strategic plans, fundraise, recruit board members, develop marketing strategies, train staff and tackle real-estate issues. Our goal is to allocate our cash and non-cash assistance in a way that maximizes their poverty-fighting impact. This document explains our evolving methodology for analyzing the impact of cash grants. We ignore the impact of our management assistance in this document because we are only beginning to develop methods for tracking its impact.

Here's the fundamental challenge addressed below. Our grantees attack poverty in different ways. Each grantee measures success idiosyncratically, making comparison difficult. For example, our charter schools count the percentage of their students who eventually graduate high school, but our job-training programs count the number of trainees that they place in jobs which last for at least a year. In this cauldron of 200 or more grantees, how does Robin Hood compare effectiveness of one grantee against another? How do we compare the poverty-fighting impact of apples (charter schools) with the poverty-fighting impact of oranges (job training for home health aides)?

Enter Robin Hood's metrics project. Its goal has been to create a methodology by which Robin Hood can measure success of its grant making by explicitly comparing the relative poverty-fighting impact of dissimilar types of grants.

We start by noting the way that commercial enterprises and financial markets measure performance. For them, commercial rates of profit provide an unambiguous standard by which to

compare performance of one firm against another or one unit within a firm against another. A company can decide whether the unit producing toothpaste works better than the unit producing shoes merely by measuring the (anticipated) rate of profit of each. Nonprofits, by the nature of their enterprise, rarely possess such clarity of goals or measurement.

*Benefit-Cost Ratios as Guideposts*

Robin Hood aims to move its measures of success closer to those of business, emulating, where feasible, the clarity and consistency of commercial rates of return. We do so because we need clear and consistent measures of success to steer grants toward groups that cut poverty the most and to reassure donors that we use their money effectively. Below we describe how we measure the poverty-fighting success of each of our grants. In short, we estimate a benefit/cost ratio for each grant. The ratio captures our best estimate of the collective benefit to poor individuals that our grant creates per dollar cost to Robin Hood - a direct analog to a commercial rate of return. Our system for estimating benefit/cost ratios relies on translations we make from outcomes of diverse programs into a single, monetized value of poverty fighting.

Because these translations lie at the heart of the metrics matter, consider the following schematic overview (details are provided later in the document).

Our grants cover different program types, including: job-training, school (kindergarten through grade 12), pre-school, micro-lending, emergency-food, housing, health, disconnected-youth and access to government benefits. At one level of generality, these programs are incomparable. The standard measure of success of job-training programs is the number of trainees trained and placed in jobs. The standard measure of a pre-K program might be the number of four-year-olds who enter kindergarten on track to start learning. The standard measure of a high school for dropouts might be the number of students who gain a high school

diploma. The standard measure of a soup kitchen might be meals served. Our hepatitis B clinics might measure the number of adults diagnosed and treated. And so on.

*Do 5 or 50 Job Takers = 1 High School Graduate?*

A key point is that none of these measures of success compares easily to that of any other. Which of these two outcomes more powerfully reduces poverty - one more person placed in a job or one more student graduated from high school? If you believe that helping someone graduate high school is more important than helping someone obtain a job, then ask yourself a cascading series of further questions: is placing 5 people in jobs more important than one more high school graduate? Are 50 job placements more important than one high school graduate? How about 500? We need to rank these outcomes to compare success across different program types. This is the challenge that Robin Hood's metrics system has been designed to meet.

How do we translate outcomes specific to individual program types into a single, monetized measure of poverty fighting? We rely on social-science literature, close knowledge of our grantees and a generous sprinkling of assumptions – all explicitly described, therefore subject to challenge and revision.

Consider training ex-offenders for jobs. We first estimate how many ex-offenders will be placed in jobs because of our grant. The research literature tells us that employment is an important condition for keeping offenders out of trouble. Then we estimate, of those placed in jobs, how many fewer will recidivate. Of those who stay criminally clean, how much will their earnings rise over their working careers over what they would likely have earned in the absence of our training program?

For early-childhood programs, we estimate how many more children enter kindergarten ready to learn than would have been true in the absence of our grant. The research literature tells

us that children who enter kindergarten ready to learn are much more likely to make it to high school graduation. We then estimate how many more children because of our grantee's intervention will go on to graduate high school and, therefore, earn more than would otherwise have been true had they dropped out.

For health clinics treating hepatitis, we estimate how much healthier patients will be who are diagnosed early and, when possible, treated. We then translate the impact of better health into a monetized estimate of the impact of our grant on patients' overall well being (overall living standards).

And so on. These quantitative translations lie at the heart of our metrics system. And each – for example, the impact of re-entry programs on future earnings of ex-offenders - depends on the literature or on independent estimates made by experts we hire.

Take the straightforward example, job-training grants. As with every grant, we estimate a benefit/cost ratio. The denominator of the ratio is straightforward. It measures the cost to Robin Hood of the grant, which in most cases is simply the size of the cash grant. The numerator of the benefit/cost ratio for these grants, measuring total benefits of a job-training program, would capture, in dollars, how much Robin Hood's grant raises the earnings of trainees over their lifetime (compared to what they would have earned without the training). The numerator for other program types – for example, micro-credit, charter-school, mentoring, after-school, housing, health programs – are defined differently (see below). But no matter what the program, the numerator of the benefit/cost ratio reflects a dollar estimate of poverty-fighting benefits. Once we have a set of benefit/cost ratios, we're led to consider shifting funds to programs with high benefit/cost ratios from programs with low benefit/cost ratios. Shifting a dollar to Program A, whose benefit/cost ratio is 5:1, from Program B, whose benefit/cost ratio is 1:1 creates $4 of

*extra* benefits for poor individuals (+$5 on Program A minus $1 on Program B) at no additional expense to Robin Hood's donors. Benefit/cost decisions rarely produce all-or-nothing decisions. The question is not whether we should fund education programs or job-training programs. Rather, the question is how many (and which) education programs do we fund vs. how many (and which) job-training programs do we fund. That should come as no surprise. Consider the following thought experiment. We decide to fund 500 programs from among a menu of 500 education programs and 500 job-training programs. To make the decision, we rank order the 1,000 programs by their benefit/cost ratios. We would not be shocked if, say, the ten best programs happened to be education programs. But we surely would be shocked to find that the 500$^{th}$ best education program were ranked higher than the very best job-training program. In the real world, the best set of 500 programs will include some from each program type.

*Benefit-Cost Ratios Alone Don't Drive Grant Decisions*

Let's note immediately that Robin Hood does NOT put grant making on automatic pilot. We do not use estimated benefit/cost ratios as the sole basis of grant decisions. Our estimated ratios inform our decisions but do not determine them - the ratios are one tool in our evaluation toolkit. For starters, the ratios are imprecise for reasons documented below. Second, Robin Hood's program officers have a wealth of qualitative data on our group's performance in addition to the quantitative measures captured by our benefit/cost ratios. Indeed, we use our benefit/cost ratios much like college officials use SAT scores inform admissions decisions. Benefit/cost ratios (SAT scores) provide an important piece of information that, along with other pieces, steer dollars (admission decisions) toward grants (candidates) with relatively high benefits per dollar of cost (high potential) and away from grants (candidates) with relatively low benefits per dollar of cost (potential).

This report describes the details by which we estimate benefit/cost ratios and the way we use them to influence grant making.

**Section 2: Preliminary Issues**

*Similar vs. dissimilar grantees*

To spend donor money wisely, Robin Hood needs, first, a metric by which to compare the relative poverty-fighting success of *similar* programs – say, one job-training program against another. Comparing similar programs is the easy part of the metrics exercise because success can be defined similarly.

For job-training programs, we might start out counting as a basic measure of success the number (or percentage) of enrollees who graduate the training program and accept a job offer. For after-school programs, by contrast, we might measure success by the number of students who improve their reading and math skills to grade level or by the number of students who graduate high school - or both. Put the issue of costs aside temporarily and focus entirely on benefits. The job-training programs that produce the most long-term job placements warrant more funding; those that produce few long-term jobs warrant less funding. Similarly, after-school programs that lift the most students to grade level warrant more funding. On this score – comparing effectiveness of similar programs – nonprofits have made progress in recent years.

Now comes the hard part: comparing success of dissimilar programs. Compare job-training with after-school programs. There is no obvious way to rank a program that places adults in jobs with a program that boosts test scores of fifth graders. As long as the two program types are measured differently, their successes cannot be directly compared. And if we cannot compare successes, then we cannot know which warrants more funding and which warrants less.

To spend money truly wisely, Robin Hood needs to compare effectiveness of dissimilar programs. We need to know, for example, if we can cut poverty by shifting money from any one of our job-training programs to any one of our after-school programs – increasing success by this

shift in resources without spending an extra dime. Robin Hood needs a metric that captures the poverty-fighting effectiveness of each grantee on a common scale that allows comparisons of one to the other. We need, in other words, an analytic framework for defining success that cuts across program types. We outline our framework below.

**We spend the bulk of this report on our system for comparing dissimilar grants because the emerging methodology, though still crude, is non-obvious and controversial. The system comprises many steps, each requiring debatable judgments calls. No step works magic. Each involves error, even bias. Each needs to be refined, possibly even rethought over the upcoming months and years. We offer this report in the hope that the back-and-forth between us and readers will nudge the methodology along. If, at the end of the traverse, other nonprofits find something valuable to use themselves, then so much the better.**

Metrics matter. Every time that we err in allocating grant money – spending too much on one group and, therefore, too little on another – we leave behind more suffering among New York's poor than necessary. Our metrics system reflects a powerful ambition: to spend money smartly, cutting poverty as deeply as possible.

*Evidentiary Standards*

Before launching into details, let's dwell on an all-important point – the standards of evidence that a metrics system needs to obey. Robin Hood's standards need not emulate those of academics. Academics prove propositions by marshalling evidence to convince disinterested parties. And to do that, propositions must be proved beyond a statistical shadow of a doubt; a standard akin to that which governs criminal trials. But such a standard would tie grant making in knots because, in general, no such failsafe evidence exists with respect to any particular

poverty-fighting grant. Robin Hood would, under the criminal-trial standard, make few if any actual grants – an unacceptable outcome. Fortunately, Robin Hood needs to adopt no such stringent standard. Instead, we base grant making on a different standard, a standard based on a simple preponderance of available evidence. That way we make grants for which the evidence in favor beats the evidence against, a practical standard akin to that which prevails in civil trials. To improve grant making at Robin Hood, we need to improve current guesswork, not achieve theoretical purity.

Grant makers generally cringe at the prospect of making decisions by formulas or quantitative calculations – and with good reason. Skepticism is advisable. But let's note that there is no way to evade the challenge of ranking the relative (poverty-fighting) worth of each grantee. Indeed, every grant that Robin Hood makes, or doesn't make, implies just such a ranking. We could have given some grantees twice as much or half as much, but didn't. We could have funded proposals that in fact we rejected. Every such decision implies quantitative ranking. The major difference between the way that Robin Hood makes grants now and before is a level of transparency. Without an explicit metrics system, the basis by which Robin Hood compares the value of grants to dissimilar groups remains opaque and, therefore, largely beyond effective challenge. But with an explicit metrics system in hand, interested parties can scrutinize our decision-making rules in detail.

*Process-oriented Evaluation vs. Metrics*

Process-oriented evaluation, though perhaps seemingly similar to Robin Hood's metrics, in fact is fundamentally different. A number of nonprofits have devoted smart thinking to the assessment of organizational capacity – the extent to which a nonprofit's practices conform to best practices. As such, these process-oriented evaluations focus on inputs alone, only rarely

tying them quantitatively to outputs. Metrics, Robin Hood style, does the opposite. It rivets on outputs and only rarely focuses on inputs. Robin Hood and other nonprofits cannot, in general, trace the success of its programs to particular inputs or procedures. The data demands for such tracing are formidable. The point here is not that one system is right, the other wrong - they answer different questions and serve different purpose. Rather, the point is to keep the distinction between process-oriented evaluation and metrics firmly in mind.

*Dealing – Or Not Dealing – with Risk*

We note here the need to take risk – the relative uncertainty of our estimates – into systematic account. So far, we have not done so. We make point estimates, albeit cautious ones, of benefit/cost ratios. We don't provide a range of values for each estimate. Nor do we discount point estimates to reflect the relative risk of grant-specific estimates. Though we keep the imprecision of our estimates firmly in mind - using them as one of several factors in our grant-making decisions – we leave for the future the task of developing sophisticated ways to handle relative risk.

***Section 3: Basic Methodology***

*The Question*

The question that our metrics system answers is whether Robin Hood can reduce poverty by shifting money (and, as our methodology becomes more sophisticated, management assistance) from one grant to another. Only if the answer to the question is "no" can Robin Hood lay claim to doing the best job possible reducing poverty among the families we serve with the money that donors entrust to our staff.

To address the question, a quick overview of Robin Hood's grant making is in order. Robin Hood divides its grants into four categories – which we call portfolios - by type of grantee. The grants within a portfolio are evaluated similarly. In the education portfolio, for example, we include both non-charter elementary schools and charter middle schools because we adopt the same measures of outcomes (for example, graduation rate and academic test scores) for both. But – and here's the important point - assignment of grants to portfolios is fundamentally cosmetic. If we were to assign a grantee to a different portfolio, we would not alter the way we measure success: the group's benefit/cost ratio would remain unchanged. Our system of metrics is applied to specific grantees. The portfolio to which the grantee is assigned is irrelevant to the assessment of benefits and costs.

Below, we briefly describe the portfolios and their subdivisions.

***Early childhood and youth*** includes programs for infant-toddlers; new mothers (home visiting); abused children; early literacy; childcare training for the staff of grantees; youngsters aging out of foster-care; college-bound young adults; juvenile justice; and disconnected young adults , including those at risk for imprisonment and those reentering society from prison.

***Education*** includes charter and non-charter public and private K-12 schools; after-school programs; tutoring; mentoring; literacy programs; school-based mental-health and special-education programs; teacher training; and "last-chance" high schools.

***Job training and economic security*** includes income-generating programs. Job-training programs serve ex-offenders, entry-level workers, and workers in need of retraining. The portfolio also includes micro-lending programs, financial literacy and other help for small businesses, including entrepreneurs. And it includes income-support programs, like Single Stop, which help families tap public benefits like cash assistance, food stamps, Medicaid and tax refunds for low-paid workers, as well as legal assistance and financial counseling.

***Survival*** includes housing programs; emergency-food supplies; services for immigrants; health and housing for individuals with H.I.V./AIDS; health programs; services for victims of domestic violence or child abuse; and syringe exchanges.

Most of Robin Hood's grants cover all or part of our grantee's operating costs. Alongside our cash grants, Robin Hood provides extensive technical assistance - management assistance - to help our grantees become effective and large. Management assistance includes help with strategic planning, financial systems, technology, board recruitment, fundraising, general governance and marketing. Robin Hood also makes capital grants to long-standing grantees so they acquire space suitable for current operations and, where possible, for expanded future operations.

*Benefit/Cost Ratio*

Our answer to the fundamental question – how do we compare the relative poverty-fighting success of grants – is to estimate benefit/cost ratios. These ratios are the nonprofit

analogy to commercial rates of return. The narrative behind the proposition is easy. The computations are not. So let's start with the narrative.

Every grant Robin Hood makes is designed to alleviate poverty. Some grants do so by keeping troubled adolescents free of a permanent criminal record. Other grants help high school dropouts return to school to get their diplomas. Still other grantees take at-risk adolescents and train them for entry-level data-processing jobs. Our grantees diagnose and treat adults threatened by hepatitis B, hepatitis C, asthma and colon cancer. Our analytical task is easy to describe: spend dollars so that the benefits per dollar are equal across grants. To do that, however, requires finding a definition of benefits that can be applied to grants in all four portfolios.

*Here's our fundamental working definition of poverty-fighting benefits of any program: the boost to income – or, to take account of improvements in health and other factors of general well being, the boost to living standards – of poor individuals due to the grant.*

Individual vs. Social Benefits

Note, first, that the definition has us counting as success only benefits that accrue to individuals, not society at large. In particular, we don't count taxpayer savings. This will strike some as odd, counter-intuitive. So let's briefly examine the basic reason.

Most benefit-cost studies of anti-poverty programs are performed from the perspective of policy makers, legislators or academics. They measure social benefits and social costs - the aggregate of benefits and costs to the entire population, netting out offsetting gains and losses to different individuals. Thus the evaluator of an early childhood program will count taxpayer savings associated with a predicted drop in prison construction and maintenance as a benefit. But from Robin Hood's point of view, such savings are largely beside the point. Donors do not give Robin Hood money so we can go out and save money for other taxpayers. Instead, donors give

money to improve the living conditions of people living in poverty. The benefits that Robin Hood counts are the *private* benefits that accrue to *poor people* because of our grants. We don't count public benefits to society at large.

Take reentry programs, designed to smooth transition of ex-offenders to civil society. Governments fund these programs in large part to cut recidivism, thereby saving future taxpayers the cost of future crime, including the need to build and run additional prisons. At Robin Hood, we fund reentry programs if the benefits to the poor individuals themselves outweigh the costs. Our metrics keep us focused on *our* mission.

This myopic focus on individual vs. societal benefits leads to surprising consequences. Programs that offer a low benefit/cost ratio to society as a whole might well represent a golden opportunity for Robin Hood. How so? Consider a program that spends an average of $30,000 to train and place an unemployed individual in a long-term job, $27,000 of which comes from pre-committed government sources and $3,000 of new money from Robin Hood. Assume, for simplicity, that the training slot would not exist without Robin Hood's grant. Looked at from the point of view of society, the program costs $30,000. But from Robin Hood's point of view, the new job placement costs $3,000 – a marvelous return, when compared to the tens or hundreds of thousands of additional earnings our typical graduates will earn over their working careers. So what an economist might show is a bad use of society's resources can, from the point of view of Robin Hood's donor, look terrific. After all, Robin Hood did not create the government program. The taxpayer dollars are, in this example, assumed committed before Robin Hood came to play. The only question for Robin Hood to ask is whether the world would look better for the poor with or without our grant. In this case, we can answer the question with a resounding "yes."

Higher-than-expected Benefit-Cost Ratios

Indeed, the benefit/cost ratios discussed below are sometimes high compared with those found in many econometric studies of policy interventions. The high numbers occur despite conscious efforts to make cautious estimates. One key reason is that our estimates capture the extent to which Robin Hood's interventions piggyback on resources provided by sources other than Robin Hood. A second reason is that Robin Hood funds only the best programs we can find – the ones with the highest benefit/cost ratios. Published studies of anti-poverty programs usually average the good, bad and the merely average example.

Note, second, that our working definition of benefits focuses primarily on income. Income is a natural focus for poverty fighting not only because the federal government defines poverty solely in terms of income but also because a large swathe of our grant making - our job-training, early childhood and education grants - fixate on helping individuals become financially independent. Other grants – including those for health, housing and emergency-food programs – do not attempt to raise cash income. But they do directly raise living standards. In theory, our working definition of benefits can be used to monetize (express in dollar terms) each of our 200 or so grants. In practice, the definition is challenging to implement for some grants. But the working definition does point us in the right direction for measures that allow us to compare, however crudely, the impact of one grant to another.

Below, we explain how we implemented our methodology, one program type at a time. Metrics are developed for each program type – for each portfolio or subdivision of a portfolio – because the key step requires translating the outcome of the program type into a measure, counted in dollars, of poverty fighting. With each program type, we identify the core poverty-fighting impact of a program type, placing wherever possible a dollar value on those benefits so they can be aggregated into a single number. For similar programs – those within a single

portfolio or subdivision of a portfolio - the process is made easier by the fact that they generally share identical goals to which a common measure of success can be applied.

Metrics at Robin Hood is a work in progress. Each year, we tackle metrics for each grantee anew. Where our measures are weak, we seek to make them stronger. Where they are strong, we seek to make them more sophisticated still. We anticipate improvement will be perpetual. We've only just started on this never-ending traverse.

*Crude Benefit/Cost Ratio for Job-Training – and its Flaws*

We start by presenting the evolution of our metrics for job-training programs. Like the evolution of all of our metrics, we start with a group of grants that share a common outcome. The trick is to translate a measure of the group's common outcome into a measure of poverty fighting that can be monetized, therefore used as the numerator of a benefit/cost ratio. Once benefit/cost ratios are estimated, grantees across program types can be compared as easily as grantees of the same program type.

Estimating benefit/cost ratios for job-training programs is the most straightforward of all program types. For starters, the goal – placing and keeping a trainee gainfully employed – can be directly observed and measured. Second, time lapse does not complicate the calculation – for job training, there is little gap between the time our families receive training and the time we can observe the outcome (job placement). Below, we describe our metric for job training in detail, thereby providing the foundation for discussing, in less detail, metrics for other types of grantees.

For our job-training programs, we start, crudely, by measuring the number of people trained, number graduated from the training program and number of trainees placed in a job for at least one year (in the future, we intend to track trainees for at least two years). Dividing the number of successful placements by the size of Robin Hood's grant yields a putative measure of

success: the number of job placements per dollar of cost - a benefit/cost ratio, as needed. The same ratio is calculated for each group, yielding a set of benefits per dollar that can be compared across job-training groups.

Flaws in Crude Measure

But this crude ratio would serve as an unreliable guide. The flaws of calculating the number of job placements per dollar of cost are, in no particular order:

1. *Non-comparable Measure*. The crude metric cannot be used to compare job-training to any other type of grantee. After all, most health, education and housing programs don't directly produce job placements. Thus the metric provides no method for comparing the relative poverty-fighting success of grants to dissimilar programs.

2. *Equally Good Successes*. The crude metric wrongly treats all job placements as equally good. From Robin Hood's poverty-fighting point of view, the assumption is untenable. A program that trains parents could lift more people out of poverty than could a program that trains single adults.

3. *Counterfactual Successes*. The crude metric counts as success anyone that the grantee places in a job. But that assumes that none of the individuals would have found jobs in the absence of the grant - an untenable assumption. Surely some of those trainees would have found jobs without training. We need to measure for each grantee how many *more* people find work (for at least a year) than would have found work without Robin Hood's help. A job-training metric needs to track the difference between the number of actual placements and the number of placements that would have occurred without Robin Hood's grant. The latter number (often called a counterfactual number, because it's not an observable fact) is fiendishly difficult to

estimate, especially in the absence of an experimental design with a randomly assigned control group.

Shortcut approximations, social scientists know, can be seriously misleading. Yet, in pursuit of the best possible evidence if not scientific purity, we must approximate nonetheless. Enter, for example, complications like demographics. Assume, for simplicity, that one job-training program trains ex-offenders and another trains immigrant nurses (by helping them acquire a license to practice nursing in the United States). Assume further that none of the ex-offenders would have found worked in the absence of training but half of immigrant nurses would have found work without the training. Consider a training program that costs $100,000 and places 10 ex-cons in full-time long-term jobs: it cuts poverty by 10. But a program that costs the same amount of money and places 10 immigrant nurses would cut poverty by only five. The former, then, would provide twice as much poverty reduction per dollar as the latter. Yet according to a metric that counts job placements per dollar of cost, the two programs rank as equally effective.

4. *Earnings*. The crude metric, by counting as benefit only job placements, takes no account of earnings. This simply does not work. Take the previously mentioned program that trains immigrants who were nurses in their home countries but have no license to practice nursing in the U.S. Assume, for the sake of argument, that they currently work at minimum-wage jobs and that the job-training program places them in $30,000-a-year nursing jobs. The program has created no net job placements. Each immigrant nurse worked before training and each works after training. But the program has tripled annual earnings, lifting every trainee out of poverty.

The extent to which job-training programs fight poverty depends not only on the ability of the program to place trainees in jobs, but also on the wages that trainees earn in their new jobs. A program's success depends on estimating the difference between the *actual* earnings of trainees and their *counterfactual* earnings - how much they would have earned in the absence of training. Counterfactual earnings depend not only on the likelihood that participants would find work without training but also on the wages they would have earned without training. Clearly, counterfactual earnings depend on the demographics of trainees – for example, different for ex-offenders than for immigrant nurses.

5. *Robin Hood Factor*. The crude metric assumes that every success of a grantee – every trainee who's placed and keeps a job for a year - is attributable to Robin Hood's grant. But that self-serving assumption exaggerates the impact of Robin Hood's grant. The question is: how many more successes occur because of Robin Hood's grant – or, equivalently, how many fewer successes would occur in the absence of Robin Hood's grant. The answer is surely not 100 percent of the group's success. However, figuring out what percentage of a group's success ought to be attributed to Robin Hood's grant and management assistance is far from straightforward. We're tempted to assume that Robin Hood should take credit for the proportion of a group's successes equal to the proportion of a programs budget that Robin Hood covers. But that's overly simplistic. After all, there are programs that would collapse all or in part if we withdrew funding even if our money is a relatively small proportion of the program's total budget – because the group has no capacity to fill in the gap. On the other hand, there are others programs for which Robin Hood accounts for most of a program's budget but which would probably survive our cuts in tact – because the grantee has the capacity to raise the money from other public or private sources. These considerations cry out for a determination of a "Robin

Hood" factor – the proportion of a group's success truly attributable to Robin Hood's grant. Robin Hood factors must, by definition, be estimated one grantee at a time.

Section 5 shows how we put the above considerations into practice to produce a benefit/cost ratio for each of our job-training grants. The interpretation is straightforward. A benefit/cost ratio of 8 means that every dollar of Robin Hood's grant raises the earnings of poor individuals by $8 above what their earnings would have been in the absence of the Robin Hood-funded training program. Unless otherwise stated, the benefit/cost ratios are lifetime estimates: $8 would reflect the present discounted value, corrected for inflation, of the benefits that accrue to the trainees over their entire careers.

### *Benefit/Cost: Some Reflections*

#### Hard-to-Measure Benefits

We've chosen as our primary metric the boost that a program gives to the lifetime earnings of participants, beginning in early adulthood (or, depending on the specific purpose of the program, boost to lifetime income or living standards). More precisely, we seek to measure how much a program boosts the earnings of a participant above what that participant would have earned in the absence of the program. We focus on income for two reasons. First, poverty is generally defined in terms of income, so that a program that boosts income directly cuts the number of poor people or the severity of their poverty. Second, most of our grantees do aim to raise, directly or indirectly, future incomes. Job training, economic development and education (pre-K, after school, charter and non-charters K-12, tutoring) and income maintenance (benefits counseling, tax refunds for low-paid workers, counseling, financial counseling, legal assistance) are all designed to raise income. Foster-care prevention and juvenile-justice programs improve

the chances that the children go on to earn their way out of poverty. So the metric fits three of the four Robin Hood portfolios more or less comfortably.

But some of our poverty-fighting programs would not appear to fit an income-focused metric. Take the emergency food groups in our Survival portfolio. In what ways does a soup kitchen or food pantry boost income? Actually, rather directly, it turns out. Many of the families visiting our soup kitchens and food pantries are neither starving nor threatened by starvation. But they are poor. So every dollar they save by eating free at our soup kitchens gives them one more dollar to spend on all of life's other necessities. For our Survival groups, the market value of the food and housing well approximates the value of the in-kind service to poor families.

Take a harder case: our health-related grantees. They add directly to a family's income by increasing the individual's economic productivity. But they also raise general well-being (standard of living) beyond their impact on earnings. To take account of such boosts to overall well being, we broaden our measure of poverty fighting to include changes in living standards. Here, we build on the work of health economists who have developed sophisticated ways to monetize the value of health interventions apart from their direct impact on earnings.

Even after accommodating many of the above-mentioned hard cases in our Survival portfolio, there remain grantees for which we have not yet found a workable fit with metrics. For example, one of our programs (Single Stop) provides low-income families free lawyers (in addition to free benefits counselor, financial counselors, social workers, job counselors and tax preparers). What's the value to a poor mother of a lawyer who helps her fight city government for custody of her child? And how does that value depend on whether she wins the case? After all, Robin Hood does not know whether the parent or the government has the better argument for protecting the child. Besides, giving a mother her day in court provides substantial value

regardless of legal outcome. As with health interventions, we'll eventually devise ways to put a monetary range on the benefits of these programs. In the meantime, we'll measure what we can and use our benefit/cost ratios as underestimates because of the known benefits for which we have, as yet, no dollar value.

## Benefit/Cost as Strategy

Should we back small organizations or large organizations? Should we back start-ups or established organizations? In other words, what are our tactics?

The answer is beguilingly simple: our strategy is to follow our benefit/cost methodology. By benefit/cost methodology, we refer to an intellectual framework. Our framework permits us, even compels us, to avoid answering strategic questions (like those posed in the previous paragraph) arbitrarily. In fact we scrutinize each proposal for its likely short-term and long-term impacts. Some start-ups will make the grade; others won't. Some large organizations will look good; others won't. The important point is that we don't need to decide what types of grants to make independent of the specific evidence (numerical or otherwise).

## Not all Dollars are Identical

Our basic metric captures the impact of a program on income. But as a poverty fighter, Robin Hood does not treat all dollars the same. Compare the following two job-training programs. Program A lifts the future earnings of individuals whose pre-training earnings average $25,000 to $30,000. Program B lifts future earnings of individuals whose pre-training earnings average $10,000 to $15,000. Each program raises earnings by $5,000 per trainee. But Program B helps poorer workers. Therefore, intuitively, we say that Program B achieves more poverty alleviation than does Program A. [Beyond intuition, economists often assume individuals experience diminished marginal utility of income – that each extra dollar of income adds to well-

being, but adds less well-being than did the addition of the previous dollar of income. However, this assumption does not allow for interpersonal comparisons of well-being.] We're struggling with the right way to give extra credit to Program B. We seek not only a weighting scheme that places the right relative value on two job-training programs but also places the correct relative value on job-training vs. education and other poverty-fighting programs. If, for example, we were to assign double weight to income gains between $10,000 and $20,000 a year for our job-training groups, then we would need to do the same for grantees in other portfolios. But that's the rub. It's simply far more difficult for early-childhood and early-education programs to know what the relative income of the beneficiaries is or will be.

## Scale

Many programs become more cost-effective when they are larger. As the after-school or job-training or mentoring program doubles in size, the program does not need to double all of it costs. Rent might not increase. The program does not necessarily have to hire a second executive director or chief financial officer. At Robin Hood, we calculate two benefit/cost ratios for each group: an estimate for the group at its current size and an estimate for the group at what we think will be its optimal size – which we hope it will achieve with our future financial help. That way we give extra credit to groups that have a shot at growing.

## Lessons from the Literature

We comb the academic literature to connect outcomes of specific program types to impact on poverty. Where the literature falls short of our needs, we hire academic consultants to fill in gaps. For job training, we borrow estimates of counterfactual earnings of ex-offenders and other demographic groups. For education programs, our consultants have developed estimates (regression coefficients) of the impact of standardized tests scores and high school graduation on

future earnings. For health-related programs, our consultants have estimated the impact of our preventive- and diagnostic-health interventions on medical well being. For early-childhood and youth programs, we borrow from the literature on the future impacts of high-quality pre-K programs and we've commissioned studies that connect specific pre-K interventions (for example, those that forge a positive mother-child relationship) to later-in-life outcomes connected to poverty. We weave these estimates into the detailed calibrations provided below.

That said, we fully recognize that the literature fails to provide tight estimates for many plausible poverty-fighting interventions. We are compelled, therefore, to inject reasonable guesses at many junctures of the metrics process. Over time, we expect to cut down on the guesswork.

**Section 4: Six Purposes**

The importance of metrics ranges far beyond ranking of grants. As will become evident as we describe the application of metrics to individual portfolios, metrics serves other key purposes. Indeed, as important as ranking is, we place it fifth among the many purposes of metrics. Here are the other five.

First, *vocabulary*. Metrics has changed the way staff members discuss grant making. Rather than defending grants because, in one paradigmatic example, "the executive director is an energetic octogenarian," we use a shared vocabulary that centers on outcomes-based evidence. You want to propose making a grant for a new program? Then provide a concise estimate, hopefully quantitative all or in part, of the grant's impact on the living standards of poor individuals.

Second, *communication*. We now have a shared way to explain to grantees, potential and actual, how their application or practice will be evaluated. One of our job-training grantees pointed with deserved pride to its record of placing graduates in unusually high numbers in long-term jobs. On that basis, we had been funding them for years. But once we applied our newly developed metrics methodology, we found that the group's benefit/cost ratio ranked among our lowest. Upon close inspection, the reason because clear. The group was starting with individuals whose job prospects were already good, so the boost in earnings was not especially large. After acknowledging the group's stellar record by its reckoning, we showed our partner why, by our reckoning, its outcomes were unimpressive. We surely did not try to bully them to change their strategic plan or implementation. But just as surely we wanted them to know why we would, after a year's time to adjust, be shifting our grant money to programs that made a bigger, deeper impact on the livelihoods of the poor people they served because they train needier people.

Third, *transparency*. Clear metrics provide a clear, detailed explanation to donors and others of how we rank grants. That way, anyone can examine and criticize – arguing for us to drop or add assumptions. We can have such discussions because we've clarified what we do. We can get to details because we expose the details. And we can try out suggestions to evaluate differently and adopt the best procedures.

Fourth, *diagnosis*. Like SAT scores for college admissions, metrics serve as a diagnostic tool. A student with 2400 SAT totals and B- grades raises issues of motivation. A student with 1500 SAT totals and A+ grades raises issues of over-achieving – work habits that succeed in high school but not at a demanding college. Benefit/cost ratios serve analogous purposes. We stare at our highest scoring grantees: what do they share in common. What inputs do they use in common? So, too, we stare at the lowest ranking groups. What procedures do they share, perhaps to their common detriment? As will be explained, sometimes what grantees share is a mismeasured metric.

The ratios surely do not automatically trigger changes in grant size. They are insufficiently precise and skip over links for which quantitative impacts remain elusive. But the ratios do lead us to ask critical questions. We first check whether a groups benefit/cost ratio, as estimated, conforms with qualitative evidence we gather. We look to increase (decrease) grants with high (low) benefit/cost ratios. But non-quantified factors can mitigate, even reverse, such presumptions. For example, some of our groups with high benefit/cost ratios are badly poised to expand.

In all portfolios, the ratios lead us to ask critical questions. When we examined the job-training groups that wound up with the lowest benefit/cost ratios, staff cringed. We regarded some of these lowest ranked groups as stars. Was staff simply wrong? It turns out that many of

our lowest ranked grantees placed trainees in jobs that started out at low wages – thus produced relatively low benefit/cost ratios – but which presented a good possibility of career advancement (relatively high wages some years into the future). Said another way, some low-ranked groups were so ranked because they were wrongly measured. Our benefit/cost calculations failed to take career advancement into account. Rather than reducing the grant to these groups, we instead fixed our metric – and increased the size of some of these grants.

Our metrics revealed other surprising truths. We had thought that job-training groups that supplied their own social services would be more effective than groups that contracted out for social services. But when we calculated success, the assumption did not hold up to scrutiny. On the basis of this finding, program officers search equally vigorously for exemplary versions of either program type.

The important point is that metrics steer attention in all the right places. Metrics guide inquiry. When groups rank surprisingly high or low, the staff asks why. What are the lessons? What are the causes? The new metric leads the staff not only to make smarter decisions but also to ask the right questions.

Fifth, *ranking grants*. Yes, we use benefit/cost ratios, along with lots of other information, to rank grants one against another.

Sixth, *measuring Robin Hood*. By the nature of our metrics, the benefit/cost ratios also tell our donors how well we've performed as a charity. The benefit/cost ratios indicate for each grant, sub-portfolio and entire portfolio, how much we estimate that we've made the lives of poor people better off with each dollar that our donors have entrusted to our organization. This last point is key. Robin Hood is often asked whether we measure ourselves with the same rigor with which we measure the success of our grantees. In fact, the two measures are identical. We

measure our grantees by the precise measure by which we measure Robin Hood: how much poverty-fighting good do we do with each dollar we spend. Our benefit/cost ratios capture, as best as we know how, Robin Hood's impact.

**Section 5: Job Training Details**

Schematically, our job-training groups admit trainees into their program. A fraction of the enrolling trainees graduate and a fraction of the graduates are placed in jobs. A fraction of those placed in jobs keep their jobs at various benchmarks: 90 days, one year and two years.

First, for metrics purposes, we start with *raw placements* or, more precisely, raw placements who keep their jobs for one year (over time, we plan to increase our time horizon to two years).

Second, we estimate a *Robin Hood factor*. Robin Hood is not, in general, the sole source of funds for our job-training groups. Government and other private funders also provide money. If Robin Hood were to cut or withdraw its grant, the program would not necessarily collapse. The Robin Hood factor offers our best guess of the percentage of raw placements that would disappear if Robin Hood's grant disappeared. Such guesswork requires, well, a lot of guesses. We sometimes take the ratio of Robin Hood's grant to the full cost of the grantee's program as a first-pass estimate of the Robin Hood factor. For some grantees this ratio captures Robin Hood's impact well enough. But for others, the simple ratio does not capture enough complexity. For example, if Robin Hood would cut or eliminate its grant, would the grantee be able to replace the money from other private or public sources? The Robin Hood factor, though subjective, relies on the intimate knowledge that Robin Hood staff has of the programs they fund. Besides, there is no guess-free way to measure a program's counterfactual boost to placements. An informed Robin Hood factor beats the alternative assumption, made by many foundations, that claims credit for all of a grantee's success.

Third, we estimate *earnings boost*: the difference between actual earnings of workers after training and counterfactual earnings (our best estimate of what the graduates would have

earned without training funded by Robin Hood). To estimate earnings boost, Robin Hood tracks how much the trainees earn on their jobs after training as well as whatever evidence we can collect on what they earned before training. We also examine evidence on earnings by demographic background (ex-offenders, recent immigrants, former substance abusers, single parents). Taking the individual's past work record and group information into account, we estimate counterfactual earnings – an estimate that takes into account not only the likelihood that the participants would work in the absence of training but also the wages they would likely have earned without training. We then subtract counterfactual earnings from actual earnings to estimate each grantee's earnings boost. This way programs that take trainees from the bottom of the income ladder can potentially make the biggest gains, and score the largest benefit/cost ratios.

Taking the three factors together – multiplying the number of actual placements by the other factors - we thereby estimate the numerator of benefit/cost ratio: total earnings gains by poor individuals traced solely to Robin Hood's grant.

The formula for estimating the benefits of job training:

Robin Hood Benefits =

| | | | | |
|---|---|---|---|---|
| [Actual Job Placements] | x | [Robin Hood Factor] | x | [Average Earnings Boost] |

We make one further refinement. The workers' higher earnings accrue over their careers, stretching over decades. We calculate the present discounted value (*) of the higher earnings to take account of timing.

Robin Hood Benefits =

| | | | | | | |
|---|---|---|---|---|---|---|
| [Actual Job Placements] | x | [Robin Hood Factor] | x | [Av. Earnings Boost] | x | [P.D.V.* $1/year for 30 years] |

Thus, take a program that trains and places 200 trainees, 20 percent of whom would lose their training slots if Robin Hood withdrew its grant (Robin Hood factor). The program is estimated to boost earnings of trainees placed in jobs by an average of $2,500 per graduate per year and trainees are expected to work 30 years before they retire. Robin Hood benefits of this program would total $1.8 million:

Robin Hood Benefits =

| | | | | | | |
|---|---|---|---|---|---|---|
| [Actual Job Placements] | x | [Robin Hood Factor] | x | [Av. Earnings Boost] | x | [P.D.V.* $1/year for 30 years] |

= (200) x (1/5) x ($2,500) x 18*

= $1.8 million

* Present discounted value (P.D.V.) of a dollar year for 30 years is about 18. [P.D.V. of an amount of money to be received at a specific date in the future is the amount of money that would have to be deposited in a bank today to generate that future amount.]

If the Robin Hood grant is for $200,000, then the benefit/cost ratio is:

Benefit/Cost = $1.8m/$200,000 = 9:1.

In other words, the program creates $9 of benefits for poor people for each dollar spent by Robin Hood. This number can then be compared to any other job-training program and, as explained below, to any of our education, early-childhood or survival programs.

Summary: We (a): observe actual placements; (b): adjust that number to estimate the number of placements that occur only because Robin Hood intervened; and (c): multiply the

number of adjusted placements by the average earnings boost. The calculation yields a measure of success that's computed in dollars.

***Bob's Jobs**: example*

Bob's Jobs is a fictitious job-training organization funded by Robin Hood. Here's basic data:

- Provides training for 150 women to become construction workers;
- Of the initial 150 trainees, 75 made it through the training and were placed in jobs;
- Of these 75 graduates, 3 dropped out of touch, 41 retained their job for at least 90 days but less than one year and 31 retained their jobs for at least one year;
- Nearly two-thirds of the trainees were unemployed prior to training, with income averaging about $6,000 yearly.
- Of those who were employed prior to training, earnings averaged about $16,000 yearly;
- Earnings of beginning construction workers placed by Bob's Jobs averaged $21,000 yearly.

Step 1: Average Pre-training Annual Earnings = $9,250
[(72 placed in jobs x 0.66 previously unemployed x $6,000 average earnings) + (72 placed in jobs x 0.33 previously employed x $16,000 average earnings)]/72

Step 2: Average annual Post-training Earnings = $21,000

Step 3: Average Annual Earnings Boost = $12,000
[average post-training earnings - average pre-training earnings
$21,000 - $9,250 = $12,000]

Step 4: Calculate earnings boost, accounting for the fact that some graduates do not keep their jobs permanently. $495,000

We assume graduates who work for at least 90 days but less than one year keep their jobs for 90 days only – obviously, an underestimate. For those who retain their jobs for at least a year, we assume they will have relatively steady work over a career, which we assume will last 30 years.

Earnings boost for 90-day placements: $123,000
[41 placed and retained 90 days x 0.25 of the year employed x $12,0003,000]

Earnings boost for one-year placements = $372,000
[31 placed and retained for at least one year x $12,000]

Step 5: Take into account the fact that raising the earnings of parents leads to higher future earnings of their children: $56,000

We know from research that increased family income increases children's future income (Dahl & Lochner, 2005) - a $1,000 increase in family income increases children's future income by about 0.36 percent. We estimate the effect of the earnings boost on the children of the women with one year retention, using Bob's Job's records on the average number of children per female trainee (1.8 children).

The estimated average earnings of the children are conservatively estimated by using today's average earnings, weighted by average educational attainment in a poverty population. We do not account for future increases in maternal earnings or the future birth of children (which, by itself, produces an underestimate).

Average Child income:
($16,000 x 0.50 will drop out of high school + $22,500 x 0.15 will graduate high school only + $27,300 x 0.27 some college + $55,000 x 0.08 will graduate college = $23,000

Boost in child earnings from rise in parental earnings: $12,000 average earnings boost for parents x 1/1000 x [0.0036 x 23,000 (average child's earnings] = $980.

31 mothers x (1.8 average number of children per mother) = 57 children

57 children x ($980 increase) = $56,000 earnings increase for children of trainees

Step 6: Present discounted values of long-term benefits: $9.2 million

To calculate the present value of earnings boost over the career of the individual, we assume a 5 percent discount factor and 3 percent real growth rate. We typically assume that folks will work about 30 years. We estimate that children average 4 years old, allowing estimation of their increased earnings beginning at 20 year of age, across 30 years.

| | |
|---|---|
| Yearly earnings boost due to job training | $ 372,000 |
| Yearly earnings boost to children | $ 56,000 |
| Total present value of long-term benefits: | $ 9.1 million |

Step 7: Total Grantee-Created Benefits = $9.3 million

| | |
|---|---|
| Total present value of benefits | $9.1 million |
| Yearly earnings boost due to job training | $120,000 |

Total benefits $9.2million

Step 8: Robin Hood factor: 0.8

| | |
|---|---|
| Robin Hood funding | $200,000 |
| Total costs of programs: | $350,000 |
| Robin Hood %: = 200,000/350,000 = | 0.6 |
| Robin Hood Factor, set at | 0.5 |

[Robin Hood factor set lower than 0.6 because staff estimates that cutting our grant would not reduce successful outcomes proportionate to our share of program budget – because the grantee could raise substitute funds]

Step 9: Robin Hood-Created Benefits = $4.6 million
$9.2 million x 0.5 = $4.6 million

Step 10: Robin Hood Costs: $200,000

Step 11: Benefit/Cost Ratio: $4.6 million / $200,000 = 23:1

*Single Stop and Economic Security*

The Jobs and Economic Security Portfolio includes, besides grants for job-training and placement, the Single Stop initiative and grants for microfinance and financial education. Single Stop, located at 40 sites in the five boroughs, provides free one-on-one, confidential problem solving. Specifically, it provides families a team of experts: benefits counselor (backed up with sophisticated software), lawyer, financial counselor, job-training counselor, tax preparer and family counselor (to address issues like substance abuse or domestic violence).

Some Single Stop services are straightforward to value: public assistance and tax refunds provide direct cash to families. Other Single Stop benefits, like sign-up for Medicaid, can be monetized (estimating the imputed value of health insurance). But other benefits are frustratingly hard to monetize. What is the value of a lawyer to a mother who needs to fight a custody case? And does the value of that lawyer, as calculated by Robin Hood, depend on

whether the mother wins or losses? And what's the value of a micro-loan to a poor entrepreneur? What's the value of financial counseling?

Some of these metrics challenges we've addressed. Others we've postponed, pending further deliberations. Below, we lay out the rudiments of our assessment of microfinance and financial-education grants.

### *Microfinance*

Robin Hood's microfinance grantees provide loans and technical assistance to current and potential entrepreneurs to start up or expand their businesses. When all goes well, the benefits of these loans fall into three broad categories. First, microfinance creates jobs. Second, microfinance saves entrepreneurs interest payments by steering them toward lower cost sources of loans and away from loan sharks or high-cost credit cards. Third, microfinance grantees, by providing smart advice, save entrepreneurs the fees they would otherwise pay banks or other sources of advice and, see below, spares entrepreneurs the loss of principal by convincing them to avoid ill-considered ventures. New ventures fail in large numbers. The Small Business Association reports that approximately 50 percent of all new firms fail within two years of operations. We take this statistic into account in our metrics.

Some of our grantees provide high-intensity support or technical assistance. But for grantees that apply only light-touch support, we assume an impact only half as much. The circumstances of the current and potential entrepreneurs who seek loans from our grantees also differ widely. While some borrowers have no other legitimate source of funding for their business plan, others do. And at the end of a thorough review process, some entrepreneurs will receive a loan from our grantee, but some will be turned down. But even those who receive no loan may well benefit from the review of their business plans by our grantee. We estimate

separately the impact on entrepreneurs who do receive a loan and the impact on those who receive advice but no loan.

How might getting turned down for a loan help a budding entrepreneur? Denial can spare applicants the loss in capital and interest payments that would follow a decision to borrow money in pursuit of a flawed business plan. We take account of the fact that not all entrepreneurs will heed the advice of our grantees by investing – probably with bad outcomes – with some other source of loans. We do so by reducing by 25 percent our estimate of the benefits of microfinance counseling for advice that convinces an entrepreneur to avoid taking out a loan on behalf of what is likely a losing proposition. .

As an example of our calculations, we introduce below a hypothetical grantee, MicroLoan, which provides loans and a medium level of technical assistance to would-be borrowers. MicroLoan's records show that about 30 percent of their borrowers have established relationships with other lending institutions, indicating an ability to borrow elsewhere. Additionally, about 35 percent of their business loans go to failed businesses (forfeiture). MicroLoan's average loan was $7,000. Of 96 loan applications, 43 were approved.

**MicroLoan**: example

Step 1: The Value of the Loan. $86,000

We know from the grantee's records that the average increase in annual household income of borrowers after a loan is about $4,000.

43 loans x $4,000 income improvement = $86,000

Step 2: The Value of Technical Assistance. $160,000

For those denied loans, the technical assistance they received during the loan-review process is worth something. We estimate that 75 percent of those denied loans will heed good advice and

avoid investing the initial $7,000 and avoid, therefore, paying 15 percent interest on the loan. For a lighter-touch grantee, we count half the value of these savings.

> (53 denied loans) x (0.75 for those who heed good advice) x 0.5 (discount for light-touch advice only) x ($7,000 in saved investment + $7,000 x 15% saved interest) = $159,994

Step 3: The Creation of New Jobs. $23,000

We estimate that a new job is created for every four successful loans, at an average salary of about $14,000. Some of the individuals hired into these new positions would have gotten jobs elsewhere. But since part of the mission of microfinance is to create jobs in areas of high unemployment, we estimate that 15 percent of the newly hired would not have found comparable employment in the absence of our grantee's intervention.

> 43 loans x 0.25 new jobs x 0.15 new positions x $14,000 average earnings = $22,575

Step 4: Interest Saved. $96,000

MicroLoan charges 15 percent interest on business loans to low-income borrowers. Many individuals in poor neighborhoods borrow from a loan shark, who typically charges 100 percent interest. Low-income borrowers are often caught in very high credit card interest rates, around 35 percent.. From MicroLoan records we know that 90 percent of their applicants are at risk of using these loan sources. We further estimate that a two-thirds would pursue a loan if not for MicroLoan, and of those who would move forward without MicroLoan, half would go to the loan shark and half to the credit cards.

> 43 borrowers x 0.9 in danger of high interest loan x 0.66 who pursue high-interest loan = 26 will borrow without MicroLoan
>
> 26 x (0.5 at 100% interest + 0.5 at 35% interest) x $7,000 average loan – (26 x $7,000 average loan x 0.15% interest paid to MicroLoan) = $95,550

Step 5: The Value of an Improved Credit Score. $11,000

We set the value of improved credit by applying the difference in the typical cell phone deposit amount required between customers with good versus bad credit scores, $250. [We take this $250 figure as a placeholder, a woeful underestimate until we settle upon a better-grounded number.]

> 43 loans x $250 = $10,750

Step 6: Savings from Separate Personal and Business Bank Accounts. $9,000

The average post-loan earnings of borrowers is about $20,000. Without MicroLoan, borrowers would typically spend about 1 percent of their earnings on business expenses; but with MicroLoan's new business account they save that 1 percent.

> 43 loans x $20,000 average post-loan annual income x .01 percent not spent on business = $8,600

Step 7: Present Discounted Value

Since about half of new businesses fail within two years, and then another half within the following two years (U.S. Small Business Administration), we allow the earnings increases to continue for two years for half the borrowers, and four years for one quarter of the borrowers at a discount rate of 5 percent and a real growth of 3 percent. The remaining quarter keeps their earnings increases over a working lifetime, estimated at about 25 years.

| | |
|---|---|
| Improved borrower earnings | $86,000 |
| Employee earnings | $23,000 |
| Total earnings | $109,000 |
| Total present value | $723,770 |

Step 6: Robin Hood Factor = .14

> Robin Hood grant $50,000
> Grantee costs $350,000
> $50,000/$350,000 =14%

Step 7: Calculate benefits

| | |
|---|---|
| Present value total | $723,770 |
| Value of TA | $160,000 |
| Interest saved | $ 96,000 |
| Improved credit | $ 11,000 |
| Separate accounts savings | $ 9,000 |
| Grand Total Benefits | $999,770 |

Step 8: Benefit Cost Ratio 3:1

> RH benefits/RH costs = [grantee benefits x RH factor]/RH costs
> = [$999,770 x 0.14]/$50,000 = 2.8

Step 9: Benefit / Cost, adjusted = 4:1

> Robin Hood has provided MicroLoan with more than funding support – we've liberally provided technical assistance and advice to them as they built their organization from scratch. Without our guidance they would likely not be as successful as they are, so we boost the benefit/cost by 50 percent..
>
> Benefit/Cost adjusted = Benefit/Cost x 1.5 = 2.8 x 1.5 = 4.2

*Financial Education*

Financial education grantees teach participants how to manage budgets, avoid or handle bankruptcy, open and use bank accounts and avoid predatory lenders – lenders who provide loans and other financial products that are inappropriate for our participant's circumstances. The table below tracks the benefits and costs of a hypothetical financial education grantee, MoneySmart.

**MoneySmart: example**

MoneySmart records indicate that 525 low-income adults attended their financial education seminars, 8 hours of training which take place one evening a week for two hours, over 4 weeks.

Step 1: Debt Reduction. $158,000

We know from MoneySmart's data that about 50 percent of their participants reduce their credit card debt by about $2,000 over a year. We estimate the average interest rate on these credit cards is 30 percent.

> 525 x 0.50 will reduce debt x 0.30 interest on debt x $2,000 average debt reduction = $158,000

Step 2: Credit score improvement. $13,000

MoneySmart's records show about 10 percent of participants are able to improve their credit scores significantly. As in the MicroLoan example above, we set the benefit at $250.

> 525 x 0.10 will improve credit score x $250 = $13,000

Step 3: Budgeting. $2,800

Fifty-five percent of participants followed the budgets they developed with help from counselors during the seminar. We estimate that this would help folks save an average 3 percent of their earnings, through less incidental spending. Robin Hood takes credit for an average 2 percent interest on this savings.

> 525 x 0.55 will follow budgets x 0.03 earnings saved x $16,000 average earnings x 0.02 interest on savings = $2,800

Step 4: Savings accounts. $46,000

About half the participants were able to start a savings account and save on average about $1000 over the course of a year. Robin Hood takes credit for the interest on the savings.

> 525 x 0.50 created savings accounts x $1000 savings x 0.02 interest = $5,250

We know that about 11 percent of participants will likely need to use their savings for an emergency, and without the savings they would turn to a loan shark or high interest credit cards. Having access to savings saves them the higher interest rate on their needed withdrawal.

> 525 x 0.11 will need to use savings x $1000 savings x 0.50 will save 0.40 interest x 0.50 will save 100 percent interest = $40,425

> Total benefit from savings accounts: $5,250 + $40,425 = $46,000

Step 5: Using bank accounts. $24,000

Having a bank account allows individuals to avoid check-cashing fees and money orders, which cost poor individuals on average $250 anually. About a third of participants started bank accounts. Based on MoneySmart's records, we estimate that about 75 percent of those newly banked will take advantage of the use of banking and cut their use of money orders and check cashing by 75 percent, saving about $188 a year.

> 525 x 0.33 newly banked x 0.75 will take advantage of banking due to less money ordering and check cashing x $188 average annual savings = $24,000

Step 6: Tax filing. $89,000

About 50 percent of participants took advantage of the free tax-filing service at MoneySmart, saving $125 in tax preparation costs. Of these, about 25 percent were new filers. We apply the benefit of filing tax returns to new filers only because we assume that people who've filed previously would most likely do so again without Robin Hood's help. The average tax refund for a new filer is about $850.

> 525 x 0.50 tax filers x $125 savings in tax-preparation fees = $32,813

525 x 0.50 tax filers x 0.25 new filers x $850 average value of reund = $55,781

Step 7: Bankruptcy. $15,000

A small number of participants declare bankruptcy due to the counseling they receive from MoneySmart. Assume from the cohort of 500 people, 15 will be advised to declare bankruptcy and that 3 will do so. Typically for low-income people, bankruptcy leads to debt forgiveness totaling about $5000.

3 bankrupt people x $5000

Step 8: Robin Hood Factor: 0.25

| | |
|---|---|
| Robin Hood funding | $50,000 |
| Total grantee cost | $100,000 |

Robin Hood factor = 50/100 = 0.50

Step 12: Benefit-Cost (unadjusted): 2:1

| | |
|---|---|
| Debt Reduction. | $158,000 |
| Credit score improvement. | $ 13,000 |
| Budgeting. | $ 2,800 |
| Savings accounts. | $ 46,000 |
| Using bank accounts. | $ 24,000 |
| Tax filing. | $ 89,000 |
| Bankruptcy. | $ 15,000 |
| Total benefits | $347,800 |

Step 13: Benefit-Cost = 2:1

Robin Hood benefits = total grantee benefits x Robin Hood factor
= $347,800 x 0.50 = $173,900

Benefit-Cost ratio = $173,900/ $100,000 = 1.8:1

**Section 6: Education**

In this section, we lay out the metric for our education programs, those that serve children in kindergarten through grade 12. Our grants cover charter and non-charter public schools. We fund so-called last-chance high schools for dropouts. And we support specific programs in public schools, including school-based mental-health services, mentoring, tutoring and after-school programs.

*Time: the key issue*

A key analytical point that distinguishes education from job training is time. With job training, we can directly measure the impact of our program on adult earnings by tracking trainees for a year or two after they complete our program. But for nearly all education programs, direct observation is not possible. Consider an education program that caters to five-year-olds. Its impact on their earnings won't be observable for 13 years or so when the child becomes old enough to graduate high school. Surely Robin Hood cannot and should not hold up grant making in education until it has the opportunity to follow children this long. Besides, by that time, the program, and the world about it, has changed, sometimes unrecognizably. Thus, we need a methodology other than the one we use in job training to appraise our education grants.

*Contemporaneous Outcomes // Statistical Links*

Here's our workaround when we can't directly observe earnings and other poverty-related outcomes as adults. We look for outcomes that have two key features.

- First, the outcomes must be "contemporaneous," capable of being observed and measured at around the same time as our intervention.

- Second, research must be available to link our contemporaneous outcomes to poverty-related outcomes when the students grow up and enter the labor force.

As a first example, take high school graduation as a contemporaneous outcome. We can, using school-system data, follow our older middle-school students as they proceed through high school, documenting how many in fact graduate. We can thereby estimate how many more of them graduate high school than would otherwise have been true in the absence of our program. We then, based on econometric literature, estimate the impact of higher rates of high school graduation on future earnings.

As another example, take standardized test scores as a contemporaneous outcome. We can estimate (waiving complications aside) by how much an education program boosts standardized test scores (above levels that the students would have achieved without Robin Hood's intervention). We have commissioned independent research to statistically link improvements in test scores to future earnings.

Here, then, is where the literature and outside consultants come to play: we use existing literature and commissioned research to marshal the statistical links – what we call poverty multipliers - between contemporaneous outcomes (for example, high school graduation rates or standardized test scores) and adult, poverty-related outcomes (for example, future earnings).

Dr. Philip Levine of Wellesley College and Dr. David Zimmerman of Williams College, our two primary education consultants, identified several contemporaneous outcomes that can be statistically linked to earnings or some other measure of well being. Specifically, they identified standardized test scores, grades, absenteeism, and grade repetition. In addition, we used existing literature to link high school graduation to future earnings. They've estimated how each of these variables, alone and in combination with the others, affects future earnings. Here is our two-step

procedure on education (and, as we'll see below, for non-education programs as well): (1) track students in each of our education programs to estimate their impacts on one or more of the contemporaneous education outcomes (test scores, attendance and the like); then (2) use our consultant's estimates to link changes in contemporaneous education outcomes to earnings.

To forge statistical links between education and poverty-fighting outcomes, Levine and Zimmerman tapped the National Longitudinal Survey on Youth (N.L.S.Y.), a survey first taken in 1979 of 12,000 people born in the late 1950s and early 1960s and repeated regularly ever since. The survey has from the mid-1980s tracked the children of female participants. Of those, about 2,000 in the year 2000 (the year of the most recently available survey) were older than 18 – the age at which high-school graduation becomes apt. Data exists for 1,500 of these children. The N.L.S.Y. thereby provides a large data base of information about children and their parents, including information about background variables that can affect a child's future earnings. The information allows us to view children when they were in school and follow them as they grow older and enter the workforce.

Some of our education-related programs affect variables that our consultants have so far not been able to link to adult poverty-related outcomes. For example, some of our education grants seek to cut criminal behavior or reduce time spent in foster care. Levine and Zimmerman combed the N.L.S.Y. to uncover statistical links between those contemporaneous outcomes and poverty. But for some contemporaneous variables, they could find no evidence in the N.L.S.Y. that links them to future earnings. For some of those variables, we found links in the literature; for others, we continue to search.

High School Graduation, Test Scores, Absenteeism, Grade Repetition

Specifically, Levine and Zimmerman estimated the following poverty multipliers:

I. Impact of test scores on high school completion, therefore future earnings: a 10 percentile point (or a 0.1 standard deviation) rise in test scores leads to 4 percent (one percent) rise in high-school graduation rates. [Robin Hood then uses estimates, widely available in the economics literature, of the impact of high school graduation on subsequent earnings beginning in early adulthood.]

II. Impact of grades on earnings: a one point rise in high school grade point averages leads to an 11 percent rise in earnings.

III. Impact of school absenteeism on earnings: an increase of 10 days of school (in a year, for students for whom test scores are unavailable) leads to a wage increase of about 2 percent.

IV. Impact of grade repetition on earnings: a student (for whom test scores are unavailable) who falls behind grade level earns about 20 percent less per year.

These separate impacts cannot simply be added together. But because we sometimes have data on only some of the four variables, the fact that we have separate poverty multipliers provides analytical flexibility. The Levine and Zimmerman analysis gives us, in theory, the ability to estimate the aggregate impact on education outcomes from separate movements in underlying variables.

*Applying Poverty Multipliers*

Even armed with these statistical links, we're left with a major challenge, previously flagged. We can observe contemporaneous outcomes – for example, changes in test scores and changes in graduation rates among students in our education programs. But we cannot observe the counterfactual – how much test scores or graduation rates would have changed had students not entered our program. Therefore we cannot directly measure by how much our education programs raise test scores and graduation rates and lower absenteeism and retention rates. As

with job training programs, the calculation of counterfactual success – success compared to baseline – is difficult without the benefit of randomly assigned control groups. But there is no way around meeting the challenge. In general, we do the best job possible finding children with similar backgrounds, motivation and achievement who do not participate in the Robin Hood-funded program and, therefore, provide a useful base for comparison. For example, we note that the percentage of students reading at or above grade level at one of our charter schools exceeds the percentage of neighborhood schools by over 30 percentage points. The gap is nearly 40 percentage points in math. The key question is whether the demographic characteristics of students in the charter school differ in important ways from the students in the neighboring schools. To answer that question, we collect demographic and relative performance data on the two groups of students – hardly the perfect way to estimate the school's impact, but the best way that's feasibly at hand.

Once we've pulled together estimates of the impact of our education grantees on contemporaneous measures of success (high school graduation rates, G.P.A., test scores, absenteeism and grade retention), , we can invoke the Levine-Zimmerman coefficients (and the literature) to translate changes in contemporaneous outcomes into dollar estimates of the impact on future earnings. By this means, we've then measured the benefits of education in the same terms as we used for job training. We proceed to estimate for each education program a benefit/cost ratio, measuring increased future earnings per dollar of Robin Hood's grant. These benefit/cost ratios can then be used to compare not only one education group against another but also any education group against any job-training group.

To rehearse metrics, for education programs:

- Using information on neighborhood schools, we estimate what education outcomes - graduation rates, test scores, absenteeism and the like - the children in schools funded by Robin Hood would have achieved without Robin Hood's grant. - We fully recognize that without randomly assigned control groups, such counterfactual estimates are hazardous.

- We observe actual outcomes, like test scores, for the children in our education programs.

- Calculating the difference between actual and counterfactual figures,, we estimate success: the changes in graduation rates, test scores, grade point average, absenteeism /attendance and grade retention due to the education program.

- We then use the poverty multipliers to translate educational success into future earnings.

The process yield up to five separate estimates on future earnings for each grantee, depending on what contemporaneous outcomes can be tracked. However, these separate estimates cannot simply be added together. There is substantial overlap among the separate impacts, so the actual combined impact of movements in the contemporaneous outcomes on future earnings is almost certainly less than the sum of separately estimated impacts. Most commonly, we estimate the impact of an educational intervention by tracking its impact on test scores or high school graduation rates.

Assume, to start out, that an education program under examination provides information on the future high school graduation rate of students in their program. Further assume, based on their enrollment and graduation data, that we estimate that the program graduates an additional 10 students each year from high school. We take from the literature the estimate that graduation, all else the same, raises future earnings of each graduate by about $6,500 a year – or about $120,000 (present discounted value) over a career. For 10 students combined, the education

program would increase earnings by at least $1.2 million. Divide the estimated earnings boost by the size of the Robin Hood grant – say, $200,000 - and we get a benefit/cost ratio of at least 5.5 (assuming, for simplicity, that Robin Hood is the sole funder). This education program raises future earnings by $5.50 for each dollar spent by Robin Hood – a metric identical to that which we used above for job-training programs. So we thereby estimate the benefit of spending money on this education programs versus that of spending money on other grantees.

The example discussed above assumes we have a reasonable estimate of the program's impact on graduation rates. But what if this Robin Hood-funded school is too new to have any data on its impact on graduation rates? In this case, we can use improvements in test scores, G.P.A. or attendance rates to estimate the effect of the program. [Using only one poverty multiplier underestimates the actual impact of the grantee. The Levine/Zimmerman study gives us the statistical means, in the rare cases when data on multiple poverty multipliers exists, to take multiple poverty multipliers into account simultaneously. See below.] We don't have a full set of data on each education program, at least not yet. So the four separate estimates allow us to make projections of earnings for a large number of current and future grantees.

To get the best prediction of future wages when multiple contemporaneous outcomes are available for the same grantee, Levine and Zimmerman employed a standard linear model to derive independent impacts of each. As summarized in the following table, a 10 percentile rise in test scores would raise hourly wages by $1.21/hour (almost $2,500 per year. And a one point increase in grade point average would raise earnings by $1.84/hour (about $3,700/year)..

| Impact on Hourly Wage (in dollars) of a: | Point Estimate Hourly Wages | Standard Error |
|---|---|---|
| | | |

| | | |
|---|---|---|
| Ten Percentile Increase in Test Score | $1.21 | 0.13 |
| One Point Increase in GPA (0 to 4 scale) | $1.84 | 0.36 |
| | | |

And an education program that does both – raises test scores by 10 percentile points and grade point average by one point – would increase wages by the sum of $1.21 and $1.84, or $3.05 an hour (over $6,000/year). These two factors alone swamp the separate impacts of the other two outcomes (attendance and grade retention). Again, we will revise and improve these estimations over time.

*Education Extensions*

*Mental-health support:* Robin Hood learned a lot from its grant making in the wake of the September 11 attacks. Specifically, we learned that by providing mental-health services on site in schools, we could help students stay in classrooms rather than shuffle back and forth between school and external mental health clinics or hospitals. We track the impact of our mental-health grants in part by measuring how much they increase the students' time in the classroom, often referred to as time-on-task. Our poverty multipliers then translate these contemporaneous outcomes into long-term poverty-fighting outcomes.

*Special education:* Other recent grants focus on helping children in special-education programs. The goal is to keep students out of special-education classes entirely or to minimize the amount of time spent in special education because time spent in special education appears to worsen long-term educational achievement. Our metrics challenge is to come up with reliable estimates for the impact of time spent in special-education classes on a student's probability of graduating high school (and then build on existing estimates of the impact of graduation future earnings). Toward that goal, we need to distinguish between programs that keep students out of

special-education programs from the get go vs. programs that transfer students in special-ed classes into regular classrooms. [This discussion presumes that there are students who, with proper support, would be better off academically if they were transferred out of special-education programs.] The impact may well be substantial. We note, for example, that only 12 percent of special-education students graduate high school, but that the rate rises to 50 percent for at-risk students who are kept out of special-education tracks. However the figures 12 and 50 do not apply to students of the same background characteristics so the 38 percentage-point gap, though suggestive, cannot be taken as a final estimate of the potential impact of lifting a student out of special-education status into regular classrooms.

*College Enrollment*. We make an increasing number of grants that help students enroll in college. We estimate the impact of our programs on college enrollment and graduation, then tap a detailed literature to statistically link college enrollment to future earnings.

*Health.* A fast-developing literature links high school graduation to improved long-term health. An already existing literature assigns monetary value (high living standard) to improved health. Health economists measure the impact of medical interventions on longevity, adjusted to take account of the quality of health during those extra years. More precisely, they measure the impact of health interventions on QALY's, for quality-adjusted life years. QALY's take account of changes in longevity and changes in medical well-being. An intervention that increases a patient's longevity by a year in perfect health increases QALY's by one. So does an intervention that increases a patient's longevity by two year at half-perfect health. We then monetize the value of QALYs, relying on standard estimates from the medical-economics literature ($100,000 per QALY).

For the purpose of education metrics, we estimate the impact of our education interventions on each of these extensions – mental health, special education, college enrollment and overall health, then link them to changes in future earnings and overall standard of living.

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*LEARN: example*

LEARN charter elementary school enrolls 400 children in second through fifth grades. Since there is not enough information about the high school graduation rate of children who graduate from LEARN at the end of fifth grade, we use, based on the work of our consultants, information on improvements in test scores as a predictor of graduation rates and future earnings.

Step 1:
Test Score Improvement leads to High School Graduation. $130,000

We know from a local study that LEARN's fourth and fifth grade students perform about a half a standard deviation better on the city's standardized tests than do the students in neighboring elementary schools. On the basis of our consultant's research, we estimate that this test-score improvement will lead to a 5 percent increase in subsequent high school graduation rates. We apply this benefit to all the children who attend LEARN, even those who are not old enough to take the city's test, since they, too, are receiving the educational support that will lead to improved high school graduation. The typical high school graduation rate in New York City is 50 percent.

(400 children) x [0.55 estimated graduation rate - 0.50 typical graduation rate] = 20 more graduates

(20 more graduates) x ($6500 yearly increase in earnings) = $130,000 annually

Step 2: Continuing on to College = $90,000

Our additional high school graduates now have the opportunity to enroll in college. College enrollment adds to the income gains from high school graduation. Attending some college increases annual earnings on average by about $5,000. College graduation adds an average of $32,500 in earnings over high school graduation (see Levin et al., 2006).

About 35 percent of low-income high school graduates will attend college and, of those, about 25 percent will earn a bachelor's degree within six years (Tinto, 2004; Mortenson, 2006). We apply these results as follows:

20 additional high school graduates, of which 0.35, or 7, will go to college. And 25 percent of the 7, or about 2, will obtain a bachelor's degree. Those 2 students will, with a bachelor's degree, earn an additional $32,500 (compared with high school graduates), for a total of $65,000

Of the 7 who go to college, 75 percent, or 5, will not earn a bachelor's degree. We use $5,000 to capture the earnings difference between workers with some college and high school graduates without college: $5,000 x 5 = $25,000.

LEARN boost annual earnings by $65,000 + $25,000 = $90,000 by boosting college attendance.

Step 3: Children's Lifetime Health

High school graduation improves lifetime health. This health bonus is estimated to be worth about $185,000 (present discounted value) (Muennig, 2006).

20 graduates x $185,000 = $3.7 million

Step 4: Present Discounted Value of Lifetime Benefits

Calculation assumes, as before, discount rate of 5 percent and real growth rate of 3 percent. Earnings-related benefits begin when children are 20 years of age and extend for 30 years. The average age of this group of children is about 9 years old.

Yearly earnings due to non-health benefits

| | |
|---|---|
| High school graduation | $130,000 |
| College attendance | $90,000 |
| Total | $220,000 |

Step 5: Present Discounted Value of Non-health Benefits $4.5 million
Present discounted value of health benefits $3.7 million

Total present discounted value of benefits $8.2 million

Step 6: Robin Hood Factor = 0.06 unadjusted

Robin Hood grant: $160,000
Total grantee costs: $2.6 million
Robin Hood percentage of budget: $160,000 / $2.6 million = 0.06

Step 7: Benefit-Cost: 16:1 unadjusted

Robin Hood benefits = Robin Hood factor x total benefits = 0.06 x $8.2 million = $492,000
Robin Hood costs = $160,000
Benefit-Cost ratio = $492,000/$160,000 = 3:1

Step 8: Adjusted Benefit/Cost = 4:1

Robin Hood factor set higher than percentage of budget (0.06) because staff estimates that the withdrawal of our grant would reduce successful outcomes disproportionate to our share of program budget—because, in part, the school would be unable to offset a major revenue loss. We increase the Robin Hood factor by 25 percent, to 0.08.

$8.2 million x 0.08 = $656,000/$160,000 = 4.1

**Section 7: Early Childhood and Youth**

*Lessons from High-Quality Programs*

Designing metrics for early-childhood programs, like education programs, is made complicated by the huge gap between the time of intervention (as young as infants and toddlers) and the time that the poverty-related impact becomes visible (early adulthood). But unlike for education grants, we have no usable stable of contemporaneous outcomes (outcomes that can be readily measured around the time of intervention that are linked by credible research to poverty-related outcomes later in life. For any one early-childhood program, its poverty-fighting impact on the current cohort of infants and toddlers won't be known for two decades or so. The excessive delay, and the infeasible cost of following cohorts of children from near birth to adulthood, explains why there is only a skimpy literature on the impact of high-quality early-childhood programs on children's long-term outcomes to guide metrics. Indeed, there are only a handful of high-quality studies, two of which used random-assignment control groups, to guide our inquiry. [See Barnett, 1995; Reynolds, et al., 2001; Belfield, et al., 2006).]

Perry Preschool offered a half-day program to four year-olds, who generally continued for two years. The program was costly. It used only certified teachers (6:1 child/teacher ratio), made weekly home visits and spent close to $10,000 (2004 dollars) per student per year (compared with $7,500 for regular public schools). Abecedarian started with four or so-month-old infants, mostly black, in a full-day year-round program. They continued until kindergarten, half of whom enrolled in ongoing programs until age eight. It, like Perry, offered academically rich services. The initial infant/teacher ratio started out at 3:1, rising to 6:1. The Chicago Child-Parent Centers started off by offering three- and four-year-olds a half-day preschool program, including a wide variety of social services, during the school year and full-time program for part

of the summer. It offered an 8:1 student/teacher ratio for preschool and a 12:1 ratio for kindergarten. Some children participated for up to a maximum of 6 years. [See James J. Heckman and Dimitriy V. Masterov, "The Productivity Argument for Investing in Young Children," manuscript.]

As explained, the three programs differed one from the other. Yet they shared four key features. Each program catered to children from disadvantaged families, offered high-quality services (by comparison to Head Start and other current early-childhood interventions), involved parents and included long-term follow-up. Cutting to the chase, the extensive literature on these model programs suggests that these intensive early-childhood programs can be expected to generate benefit/cost ratios of 5:1. The benefits include better academic achievement, less criminal activity and higher paying jobs. The 5:1 figure is lower than the 7:1 or 8:1 ratios associated with these studies. We used the lower figure because Robin Hood does not count some of the benefits that lie behind the higher figure. Specifically, as explained above, Robin Hood focuses solely on private benefits that accrue to poor individuals and skips over social benefits like taxpayer savings.

So we launched our early-childhood metrics by assigning each such grantee a provisional benefit-cost ration of 5:1. Yet we choke on this number for two reasons. First, the 5:1 figure may well be an underestimate of the poverty-fighting impact of early-childhood programs because the studies behind the figure did not explicitly capture the health benefits - therefore the boost to future living standards - generated by high-quality early-childhood programs. Second, and more fundamental, we recognized from the get go that a one-size-fits-all number would constitute an unsatisfactory end point. The 5:1 ratio applies globally to high-intensity programs. It provides no means by which to judge the impact of any one of our individual grantees. The

first, crude, way we've generated grantee-specific ratios was to assign a 5:1 benefit/cost ratios to all of our early-childhood programs and then adjust that figure up or down to conform roughly to our intuitive sense of the relative quality of each of our program compared with the three model programs. This provides the roughest of justice, at best.

To generate more informative ratios, we've undertaken the same type of investigation as we used for education. We search for contemporaneous outcomes – immediately observable outcomes - that can be statistically linked to later-in-life, poverty-related outcomes. For example, we know that high-quality early-childhood programs boost high school graduation, therefore future earnings. We also know that high-quality early-childhood programs cut juvenile arrests, thereby boosting future earnings. We're tempted to add these two impacts together. But we know that would be wrong. The two contemporaneous outcomes overlap: some of the earnings boost attributed to high school graduation is due to the fact that high school graduates participate in less crime. The problem, which we have just begun to tackle, is estimating the extent to which the simple sum of the poverty-fighting impacts of separate contemporaneous outcomes (like high school graduation and criminality) exaggerates the total impact of early-childhood programs. We make corrections for the possible double counting by lopping 20 percent off the benefit/cost ratios that are initially estimated by adding separate impacts of contemporaneous outcomes. See below for an example. We'll explore more sophisticated corrections in the future.

Early childhood programs do not ensure that children stay away from crime as adolescents, graduate high school, earn their Associate's or Bachelor's degree or get and keep well-paying jobs. But the best programs raise the probability of each of these milestones. Our metrics monetize the poverty-fighting value of these higher probabilities.

The leaders of our early-childhood grantees resist, for some good reasons, the notion that they should be held responsible for the outcomes later in life of the children they serve. After all, they lose control once children leave their protected confines. But if in fact the graduates of high-quality early-childhood programs do no better than non-graduates later in life, then a poverty fighter like Robin Hood would have no reason to fund such programs. If early-childhood programs don't arm children to ward off future assaults on their well being, then funding the program would amount to little more than an indulgence.

In fact, burgeoning literature shows, early-childhood programs do indeed lift the probabilities of long-term success.

***FirstKid**: example*

FirstKid enrolls at risk preschoolers in a center-based program, 65 of whom score in the developmentally delayed range on screening tests. FirstKid provides medical and psychological supports as needed. Here are the steps in our metrics determination.

Step 1: Increased probability of high school graduation. $115,000.

High-quality early-childhood programs boost high school graduation rates by an average of about 30 percent from a baseline level in New York City of about 50 percent. High school graduation, in turn, increases earnings by about $6,500 a year for each year of employment – a boost generally attributed to personal skills (productivity). Of these high school graduates, about 35 percent will enroll in college (adding an additional $5,000 to their annual incomes). Of those who enroll in college, about 25 percent will graduate (adding $30,000 to average annual earnings above those of high school graduates).

FirstKid serves 100 children. Therefore about 50 of them would be expected to graduate high school without intervention. But with Firstkid's intervention, we expect 30 percent more will graduate. Of those, expect 65 percent will not enroll in college (but earning $6,500 more each year) and 35 percent will enroll in college, of which a quarter will earn a B.A.

100 x 0.5 x 0.30 = 15 extra high school graduates
65 percent (or 10) won't enroll in college; 35 percent (or 5) will enroll in college

For the 10 non-college enrollees:
Extra annual earnings: 10 x $6,500 =$65,000

For 5 college enrollees, of whom 4 won't earn a B.A. and 1 will earn a B.A.:
Extra annual earnings: [4 x $5,000 + 1 ($32,500)] = $52,500.

For all 15 high school graduates: $65,000 + $52,500 = $115,000.

Step 2: Health. $2.7 million (present discounted value)

High school graduation also leads to better health - worth, the literature estimates, about $180,000 (present discounted value) above the earnings boost.

[15 graduates x $180,000 = $2.7 million]

Step 3: Juvenile Arrests. $13,500

High-quality early-childhood programs reduce juvenile arrests by about a third. A typical juvenile arrest rate for low-income, urban areas is about 9 percent, so we would estimate that a third less than 9 percent, or 6 percent, of preschoolers in a high-quality preschool program would be arrested as juveniles due to the preschool program.

The avoidance of such arrests, some studies show, raises adult earnings by about 20 percent. We note that early-childhood programs raise earnings because they boost high

school graduation, but also because they reduce juvenile arrests. Moreover, part of the reason that high school graduation raises earnings is that it cuts criminal behavior. To merely add the separately estimated impacts of early-childhood programs on earnings via high school graduation and via juvenile arrests would exaggerate the impact of juvenile arrests. This is accounted for in the final calculations. To estimate the value of this effect we add 20 percent to the average earnings of a high school graduate for the number of children calculated to avoid arrest.

[100 children x 0.09 (arrest rate without FirstKid's help) x 0.33 (FirstKid's impact on arrest rates) x $22,456 average earnings high school graduates x 0.2 additional earnings = $13,500]

Step 4: Medical assessments and referrals. $700,000

FirstKid provides physical and mental evaluations, makes referrals and coordinates treatment. Our consultants at the public-health school at Columbia University estimate the impact of the health components of our early-childhood grants. Following the econometric literature on the topic, and as explained above, they measure health benefits in QALY's, Our consultants estimate that FirstKid's medical assessments boosted the health of the children by 0.07 QALY's above baseline (above the health of children who enroll in Medicaid but not FirstKid). At $100,000 per QALY, FirstKid's medical assessments raise living standards by about $700,000 for the 100 children per year that FirstKid enrolls.

[100 children x 0.07 QALY x $100,000 = $700,000]

Step 5: Coordinated medical services**.** $280,000

An increasing number of health facilities are turning to "patient navigators." They serve as case managers, successfully shepherding patients through often-complicated mazes so

that they get every service they need. FirstKid's coordination function serves an analogous function. From programs for which Robin Hood funds patient navigators, we observe that adherence to medical treatments rise by about 40 percent. We add 40 percent to the $700,000 medical benefits total to take account of the coordination function.

[$700,000 x 0.4 = $280,000]

Step 6: Mental-health support for parents and children. $520,000

FirstKid provides mental health therapy to parents of its children, with about 65 percent of families taking advantage of the most intensive services FirstKid provides. We apply this benefit to 65 parents and 65 children (130 people), putting aside any additional benefit that might accrue to siblings. Our consultants estimate that this intervention boosts the health of these parents and children by an average of 0.04 QALYs (above increases they would realize were the children not enrolled at FirstKid), for a total value of over half a million dollars. [We note that by improving the mental health of parents, we also improve the quality of life for their children. We capture this impact at the end of our calculations.]

[130 x 0.04 x $100,000 = $520,000]

Step 7: Parenting education helps children in several ways.

Better parenting improves children's GPA**.** $17.000

Better parenting leads to less child abuse. $1.2 million

Better parenting improves children's quality of life. $130,000

FirstKid has a parenting education component specifically designed to improve the parenting skills of the parents of enrolled children, and about 65 percent of parents take advantage of this service. Better parenting education leads to better school performance; research indicates that better parenting for children in early childhood is linked to children's higher high school GPA (Gregory, et al. (2006). We estimate that FirstKid's early-intervention services raise G.P.A.'s by about 0.13 points. Using Levine and Zimmerman's calculations, we estimate this GPA increase will lead to a 1.3 percent increase in average annual earnings, (up about $250 per child from a baseline of about $20,000 (Levine and Zimmerman).

[65 children x $20,000 x .013 = $17.000]

High quality early childhood programs reduce incidents of parental abuse by about 50 percent, perhaps through an effect on parenting. Such incidents, the literature tells us, cut future living standards (as measured in QALY's) by about $24,000 each. We conservatively estimate that FirstKid's intervention reduced the incidence of child abuse on average by one incident per child. Nearly all of FirstKid's enrolled children have been referred by city agencies, making them at very high risk for abuse. Therefore we use a counterfactual value of 100 percent for the rate of abuse in the absence of FirstKid's help.

[100 children x 0.5 x $24,000 = $1.2 million]

Effects on academic performance and child abuse aside, good parenting provides for better all around quality of life for children. We borrow from the .02 QALY associated with improved domestic violence (Muennig, 2005) to represent this concept.

[65 x 0.02 QALY's x $100,000 per QALY = $130,000]

Step 8: Parental income and its effect on children.

Parental income. $195,000

Effects of parental income on children. $16,500

FirstKid saves parents daycare fees and frees them to work. For those families who would have to pay fees in the absence of Robin Hood's grant to FirstKid (about 30 percent of families), savings will average $2,500/year.

[30 families x $2500 = $75,000]

Poor families receiving subsidies for child care are about 12 percent more likely to work when their child is enrolled in full day high quality care. In New York City, this increases work rates among poor families to about 52 percent from 46 percent, raising earnings for those families by about $20,000 a year.

[100 x 0.06 x $20,000 = $120,000]

Another source of earnings boost: higher income of parents raises the expected income of children. For every $1,000 increase in parental income, child income rises by about $83 a year on average (using Dahl and Lochner (2005)). In the case of FirstKid, parental income increased nearly $2000 due to fees saved and increased employment. .

[$2000 average parental income boost/$1000 increments = 2 increments per child ($83) = $166

100 x $166 = $16,500]

Step 9: Remediation of developmental delay improves quality of life. $390,000

Model preschool programs reduce the number of Special Education placements (from kindergarten through high school graduation) by, perhaps, 20 percent. For FirstKid, we'll use 15 percent. We take the 15 percent improvement in special-education placements as

proxy for the impact of FirstKid on the developmentally delayed children's overall outcomes, of which quality of life is very important. The early-intervention literature suggests that neurological disabilities reduce a child's QALY by 0.4. We estimate that FirstKid makes up 15 percent of the shortfall, based on the above finding. If so, then FirstKid improves the children's living standards by about $390,000 annually.

[65 developmentally delayed children x 0.4 x 0.15 x $100,000 = $390,000]

Step 10: Present discounted value of lifetime benefits

Health-related benefits are extended over a lifetime estimated at 65 years, while earnings-related benefits begin when children are 20 years of age and extend for 30 years, at a discount rate of 5 percent and real growth of 3 percent. We estimate the average age of enrolled children at 4 years old.

| | |
|---|---|
| Earnings-related benefits | |
| High school graduation and college | $ 115,000 |
| Children's earning due to no jail | $ 13,500 |
| Children's earnings due to GPA | $ 17,000 |
| Children's earnings due to family work/savings | $ 16,500 |
| Total | $162,000 |
| Health-related benefits | |
| Medical assessments | $ 700,000 |
| Medical coordination | $ 280,000 |
| Remediation of dev delay | $ 390,000 |
| Total | $1,370,000 |
| Total present value | $50 million |

Step 11: Robin Hood factor. 0.12

Robin Hood funding $300,000
Total grantee cost $2,500,000
Robin Hood factor = 300/2500 = 0.12

Step 12: Benefit/Cost (unadjusted) 22:1

| | |
|---|---|
| Present value of increased earnings | $50.3 million |
| QALY due to high school grad | $ 2.7 million |

| | |
|---|---|
| HRQL due to MH | $ 520,000 |
| Savings due to less abuse | $ 1.2 million |
| HRQL due to improved parenting | $ 130,000 |
| Parental income | $ 195,000 |
| | |
| Total grantee benefits | $55 million |

Robin Hood benefits = total grantee benefits x Robin Hood factor
= $55 million x 0.12 = $6.6 million

Benefit/Cost ratio = $6.6 million / $300,000 = 22:1

Step 13: Benefit /Cost (adjusted) = 18:1

FirstKid affects many factors, itemized above, that ultimately makes the children better off as adults, including high school graduation, health, juvenile arrests, medical assessments and medical referrals. But because these variables interact, the total impact on students is not the simple sum of the separately estimated impacts. Absent a reliable way to take account of various interactions, we mitigate double counting by reducing the benefit/cost ratio by 20 percent.

Benefit/Cost adjusted = Benefit/Cost x 0.8 = 22 x 0.8 = 18

**Section 8: Survival**

*Not Just Palliative Care*

Robin Hood expects its early-childhood and youth, education and job-training grants to "cure" poverty, to provide at-risk individuals with the means to escape poverty. Our Survival programs are at least partially different. They primarily provide palliative care. Take supportive housing and emergency food groups. Putting a roof over the heads of a homeless family does not in and of itself add to the family's long-term earnings. Giving hungry individuals hot meals does not in and of itself give them the means to improve their long-term earnings prospects.

But the distinction between palliative care and cure is too sharp to serve as a guide to the way in which our Survival grants differ from those in our other three portfolios. Two points:

First, Survival metrics rely relatively more on a broadened measure of benefits, focusing less on earnings and more on changes in overall well being (changes in standards of living). Take health grants. As we described above for health components of our education and early-childhood programs, we tap the literature that monetizes the value of specific types of health interventions.

Here's a rundown of Survival metrics.

*Housing*

The key fact about Robin Hood's housing groups is that they provide supportive services. To track their impact on poor individuals requires tracking the impact of those many services. For our housing groups, we calculate benefit/cost ratios thusly.

First, we multiply the number of housing units that our grant provides by an estimate of their rental value to poor residents. [We plan to consider better measures of value to the poor of the housing units our grants provide.]

Second, we add research-based estimates of the value of the mental health services and primary-health care services (measured in QALY's) that our housing grantees provide residents. Recent research shows that supportive housing for previously homeless individuals who are mentally ill or substance abusers cuts the need for acute medical care by 30 percent (the medical literature applies an average 1.3 QALY increase to the residents who avoid acute medical care). We also know that supportive housing reduces prison recidivism among ex-offenders by about 60 percent, but we are still working on including this benefit in our metrics.

Third, we estimate the impact of job-placement and other non-housing benefits that our grantees provide as part of their supportive-housing environments. For example, some housing grantees provide domestic-violence prevention programs. That reduces physical and emotional damage and, in the extreme, saves lives.

Finally, we apply a Robin Hood factor (the percentage of the benefits attributable to the grantee that Robin Hood's grant alone creates).

We recognize that our current approach does not capture the full array of supportive benefits. Here are shortfalls that we will work to overcome.

- Some of the families we currently support have benefited enough from their year of supportive services that they are ready to move on. All else the same, Robin Hood's dollars would be better spent if these families vacated the subsidized housing, opening slots for needier families. On the other hand, these veteran families may, by their continued presence, may help create a "normalizing context" diverse and healthy enough for fragile families to achieve stability. Going forward, we need to address the value of providing housing services for permanently housed families – spending large amounts each year on the same

families – vs. temporary housing, which provides supportive services to different families as residents recover and move onto to permanent housing arrangements of one kind or another.

- We start with the estimate that homeless kids are 12 times as likely as stably housed kids to be placed in foster care, 3 times as likely to have a learning disability and 8 times as likely to show mental retardation. We know that about half of homeless children show symptoms of acute illness. We seek to learn how stable housing remediates these troubles for children.
- Related research found that stable, supportive housing promotes reunification among family members separated by foster care and incarceration. What is the value of keeping a family together?

**Helpful Housing**: example

We base the value of housing provided by our grantees on market prices. Specifically, we use fiscal-year 2006 fair market rent prices for New York City as published by the federal Housing and Urban Development (HUD) (http://www.huduser.org/datasets/fmr/fmrs/2006summary). They represent the 40th percentile of the range of rent prices in the city.

| | | |
|---|---|---|
| Efficiency | $940/month | $11,300/year |
| 1 bedroom | $1,003/month | $12,000/year |
| 2 bedroom | $1,133/month | $13,600/year |

Step 1: The value of housing. $8.6 million

Helpful Housing provided 672 housing units (efficiencies or one-bedroom units) with a 96 percent occupancy rate over the last contract year, housing 887 people. Because we don't know the relative numbers of units of each type, we average the values. These housing units are provided to homeless individuals or couples who need supportive services to remain stably housed. Because these individuals are unlikely to find low-income housing with the services they need in a timely fashion in the absence of Helpful Housing, we assume that the full market value of Helpful Housing's units represent a net gain to the residents (that the value of housing for these homeless individuals in the absence of Helpful Housing would be near zero).

[672 x $11,700 average per year = $7.8 million]

Helpful Housing also provides 75 low-income families housing (two-bedroom apartments) without supportive services. These families live as neighbors with individuals who do require supportive services, creating the mixed-population residence. Research literature suggests that mixed-population residences produce better outcomes for the more at-risk individuals. The low-income individuals pay about 30 percent of their income in rent (about $2,400 a year), making the housing value they receive about $11,200 per year ($13,600 - $2,400 = $11,200). Given the difficulties of finding affordable housing in the city, we estimate that about 10 percent of these 75 families would have been able to find equivalent housing without the help of Helpful Housing.

[75 families x $11,200 x 0.90 = $760,000]

Step 2: Supportive services.

2a. Referrals to medical care. $2.3 million

Helpful Housing provides about 1 medical referral per year to nearly every resident. We estimate that 30 percent would find their way to medical services even without the referral. Such referrals, our consultants say, are worth 0.07 QALY.

672 clients x 0.07 QALY x $100,000 per QALY x 0.7 (to account for the referral) x 0.7 (to account for those who would tap medical services without Helpful Housing's help) = $2.3 million

2b. Mental health care. $1.9 million

Helpful Housing provides psychological supports. Overall 517 residents received an average of 15 hours of mental health counseling over the contract year. We value these services at 0.04 QALY (Muennig, 2005) and assume that 10 percent of residents would have received such counseling on their own (even without the help of Helpful Housing).

517 x 0.04 QALY x $100,000 per QALY x 0.90 = $1.9 million

2c. Employment training. $800,000

Helpful Housing placed 55 residents in jobs at $12/hour, with 35 percent of placements receiving fringe benefits equal to about 20 percent of their wages. We estimate that 56 percent of residents placed in jobs retain their jobs (based on Helpful Housing's track record). Given the trouble that residents have maintaining employment even with Helpful Housing's supportive services, we estimate that none of the long-term placements would have been employed in the absence of Helpful Housing's services.

Earnings = [55 residents x 0.56 retention rate x 0.65 work without fringes x $12/hour x 2000 hours of work per year] + [55 residents x 0.56 retention rate x 0.35 rate with 20

percent fringe benefits x $14/hour compensation x 2000 hours of work per year] = $800,000

2d. Quality of Life issues. $3 million

Employment services, other training and education services improve the quality of life of formerly homeless residents, especially those who suffer from mental illness, beyond their role in helping resident find and hold jobs. Helpful Housing provides training in self advocacy, education skills, daily adult living skills and employment skills, though they did not record the number of individuals who received these services. We estimate an additional mental health benefit to those who received employment training to account for these services.

[747 people served by employment training programs x 0.04 QALY x $100,000 per QALY benefit = $3 million]

2e. Case management. $2.9 million.

Helpful Housing's case-management services provide medication management, symptom management for substance abusers and the mentally ill, conflict resolution and money management. We estimate the value of these services at 0.3 QALY, based on findings of similar, though less intensive, case management for low-income diabetes patients (Gilmer et al., 2007). Helpful Housing reports 97 individuals are enrolled in intensive support services.

[97 x 0.3 QALY x $100,000 per QALY = $2.9 million]

2f. Reduced hospitalizations and medical emergencies. $1.9 million

Provision of supportive housing reduces the number of formerly homeless residents who visit emergency rooms and reduces hospitalization by about 20 percent (Culhane et al., 2002). About 270 residents at Helpful Housing were hospitalized. We estimate that 67 residents avoided hospitalization due to Helpful Housing. Research literature suggests that 80 percent of hospitalized homeless have primary or secondary mental illness or substance-abuse conditions. We estimate the value of the treatment of mental illness to be 0.33 QALY (the average of the QALY values for the treatment of depression (0.25) and schizophrenia (0.4). We apply the 0.33 QALY gain to 80 percent of the 67 residents whom we estimate avoided hospitalization because of Helpful Housing's services. To the remaining 20 percent we assign a value of 0.07 QALY [the difference in QALY's between those who need hospitalization for general diagnoses (0.93) and those who live in full health (QALY = 1.0, by definition).

[67 who avoid hospitalization x 0.8 with mental illness/substance abuse conditions) x 0.33 QALY x $100,000 per QALY] + [67 x 0.2 with general treatable conditions x 0.07 QALY x $100,000 per QALY] = $1.9 million

Step 3: Present Discounted Value

As above, lifetime benefits are evaluated at a discount rate of 5 percent and a real growth of 3 percent. We estimate that the average age of residents at Helpful Housing is 40 years old and calculate employment-related returns to age 55 and health-related returns to age 65.

| | |
|---|---|
| Medical care referrals | $1.9 million |
| Employment | $800,000 |
| Total present value | $46.3 million |

Step 4: Robin Hood Factor = .04

Robin Hood grant $450,000
Grantee costs $12 million
$450,000/$12 million = 4%

Step 5: Calculate benefits

| | |
|---|---|
| Present value total | $46.3 million |
| Housing | $8.6 million |
| Mental Health QALY | $1.9 million |
| Employment training QALY | $3.0 million |
| Case-management QALY | $2.9 million |
| Reduced hospitalizations | $17.5 million |
| Grand Total Benefits | $80.2 million |

Step 6: Benefit Cost Ratio 6:1

RH benefits/RH costs = [grantee benefits x RH factor]/RH costs
= [$80.2 million x 0.04]/$450,000 = 7:1

Step 7: Benefit / Cost, adjusted = 6:1

Helpful Housing provides supports that work together to some extent to make changes in client's lives. Here again, the total impact on clients is not the simple sum of the separately estimated impacts and we mitigate double counting by reducing the benefit/cost ratio by 20 percent.

Benefit/Cost adjusted = Benefit/Cost x 0.8 = 7 x 0.8 = 6

*Health-Related Grants*

The Survival portfolio includes an increasing number of health-related grantees. There is now a burgeoning literature that assigns monetary values to health outcomes of specific medical interventions. Robin Hood's consultants at Columbia University have guided the application of up-to-date techniques to our grant making. As indicated above, the basic measure of medical well- being is the QALY. An intervention that improves longevity by one year in perfect health is worth one QALY; an intervention that improves longevity by one year at half perfect health is worth ½ QALY. The literature generally assigns a value of $100,000 per QALY. Below, see a health-related example of metrics.

**Feelbetter Clinic**: example

Robin Hood funds programs at Feelbetter that focus on asthma, cancer screenings and hepatitis. We also fund an innovative way to care for poor patients known as patient navigation.

For asthma, the clinic provides initial asthma screenings, intervention and remediation. The clinic also provides referrals for issues that exacerbate asthma like obesity and smoking.

Step 1: Asthma screenings. $780,000

This year, 896 children were screened, 280 of whom were found to have asthma. Of the 280, 155 did not enroll in the asthma program. We estimate that the annualized QALY value of the initial asthma screening for those children who test positive at 0.05 QALY, to be applied only to those children who tested positive but did not enroll.

[155 x 0.05 QALY x $100,000 per QALY = $780,000]

Step 2: Comprehensive asthma intervention. $2.9 million

The value of a year of a comprehensive asthma intervention is estimated at 0.05 QALY (Muennig et al, 2005). This gain is applied to all 586 enrolled children, including 461 previously enrolled children and the125 newly enrolled.

[586 x 0.05 QALY x $100,000 per QALY = $2.9 million]

Step 3: Goods and services to remediate physical asthma triggers in the home. $64,000

The provision of goods and services to families with enrolled children is considered separately from the medical intervention. The Feelbetter Clinic provides the following items to all families enrolled in the program: HEPA vacuum cleaner, air purifier, allergy-free mattress pads, box-spring covers and pillow cases, food storage containers, metered-dose inhalers, a peak flow meter and pest control services when needed. The value of these items is calculated using the low-income market value of donated goods and services, about $64,000.

Step 4: Home health assessment/improvement. $330,000

Enrolled families receive an initial home visit in the first year, to assess the health of the home environment and to educate parents about environmental asthma triggers. These triggers were found in all 125 homes. Home visits are repeated quarterly and improvements are measured. This service is additional to the medical intervention, and is conservatively estimated here since the benefits a healthier home would affect everyone in the family, not just the target child. The average improvement across all asthma triggers over a year is about 53 percent. We use the value of a comprehensive asthma intervention to estimate the value of this service.

[125 x 0.53 improvement x 0.05 QALY x $100,000 per QALY = $330.000]

Step 5: Increased school attendance. $17,600

Home visit interviews tell us that school attendance improved by about 66 percent during the year. Children with asthma are absent from school about 7.6 days per school year (Currie, 2002) and that an additional 10 days in school is related to a $0.03 per hour increase in wages after high school graduation (Levine & Zimmerman, 2005). So, we estimate that the Feelbetter clinic is worth about 5 more days of school attendance per year, per child (= 7.6 x 0.66 = 5).

[586 enrolled children x (5 more days each) = 2,930 more attendance-days/10 = 293 10-day periods
293 x $.03 an hour (2000 hrs/yr) = $60 increase in yearly earnings
293 x $60 = $17,600]

Step 6: Referrals. $670,000

The Feelbetter Clinic referred 399 families to environmental, medical, educational or social support programs. The value of a referral is estimated at 0.7 of the value (in QALY's) of the referred intervention.

Obesity. $18,000

36 children were referred to and enrolled in an obesity prevention program. The value of a school-based obesity prevention program is about 0.71 QALY for the 1 percent of children who lose weight (Wang, Yang, Lowry & Wechsler, 2003).

[36 children x 0.01 (who lose weight) x 0.7 (value of referral) x 0.71 QALY x $100,000 per QALY = $18,000]

Legal services. $24,000

The most common reason for legal referrals related to asthma is the condition of housing. Based on our experience with the value of legal services for the poor, we estimate about $1,000 in value to families for this service. Feelbetter Clinic sent 34 people to lawyers.

[34 x 0.7 x $1,000 = $24,000]

Smoking cessation. $630,000

The number of enrolled families in which a family member smokes in the home was reduced from 38 percent to 33 percent over the year, due to referrals to a smoking cessation program. About five family members quit smoking. Research indicates that quitting smoking for one year results in a gain of 1.2 QALY (The Quit Group, Ministry of Health, UK). From this, we estimate the gain due to the lower rate of passive smoking for children to be 0.6 QALY, conservatively estimated since the benefit would accrue to all family members but is here only applied to the target child.

[5 quitters x 0.7 value of referral x 1.2 QALY's x $100,000 per QALY + 5 children of quitters x 0.7 x 0.6 x $100,000 = $ 630,000]

Cancer Screenings $1.2 million

The Feelbetter Clinic reports an estimated 269 cancer screenings were performed over the contract year. Eighty-four percent of the screenings are for colon cancers, 7 percent for prostate cancer, 5 percent for cervical cancers and 4 percent for breast cancer.

Colon Cancer. $1.1 million

Research indicates that screening for colon cancer with colonoscopy produces an average additional 0.05 QALY compared to no screening (Taffazoli & Ness, 2005).

[269 cancer screenings x 0.84 for colon cancer x 0.05 QALY x $100,000 per QALY = $1.1 million]

Prostate cancer. $94,000

Research on the effects of prostate cancer screening are inconclusive and do not include effects on poverty populations. We borrow the 0.05 QALY value from the colon cancer research here.

[269 x 0.07 for prostate cancer x 0.05 QALY x $100,000 per QALY = $94,000]

Cervical cancer. $13,500

Cervical cancer screening raises QALY's by an average of 0.01, compared to no screening (Mandelblatt et al 2002).

[269 x 0.05 for cervical cancer x 0.01 QALY x $100,000) = $13,500]

Breast cancer. $10,800

Breast cancer screening increases QALY's by 0.01 over no screening (Stout et al, 2006).

[269 x 0.04 for breast cancer x 0.01 QALY x $100,000 = $10, 800]

Step 7: Patient Navigators. $475,000

Patient navigators represent a relatively new concept in the delivery of complex medical services to underserved populations. The goal of a patient navigator is to reduce patient attrition from the medical care process by tracking and reconciling referrals, the provision of care, patient compliance with appointments and tests and by communicating with patients about barriers to their medical care. The idea is that poor patients will adhere better to treatment regimens if guided by dedicated medical professionals. The Feelbetter Clinic has implemented a patient navigation program for their cancer patients. They report that of the 200 patients "navigated" this past contract year, 75 (or about 40 percent) needed the special assistance to overcome language, transportation, money or other barriers that would otherwise have interfered with medical care.

To take account of the special help, we add 40 percent to the QALY values specified previously – probably an underestimate of the actual value of patient navigation because the 40 percent figure is based on the impact (measured in QALY's) of navigation during screening processes. Some navigators also assist patients during medical interventions.

[$1.2 million in total cancer screening benefits x 0.40 = $475,000]

Step 8: Hepatitis $11.3 million
Vaccinations. $3.8 million

Feelbetter Clinic's Hepatitis B clinic provides vaccinations to those for whom screening results are negative, which research tells is worth about 0.20 QALYs in a high risk population. Over the past contract year, 525 patients were screened for Hepatitis B. Forty percent testing negative, 90 percent of whom were subsequently vaccinated.

[525 x 0.40 negative x 0.90 vaccinated x 0.20 QALY x $100,000 per QALY = $3.8 million]

Treatment. $7.6 million

Medical interventions for Hepatitis B infection are worth about 2.4 QALY over a lifetime. Of the 60 percent screened who were found positive for Hepatitis B infection, 10 percent were treated.

[525 x 0.60 positive x 0.1 treated x 2.4 QALY x $100,000 per QALY = $7.6 million]

Hepatitis C. $2.9 million

Treating Hepatitis C raises QALY's by about 0.73. However, some research indicates that viral genotype is an important factor in determining treatment efficacy, with Genotype 1 being much harder to treat. We use 0.43 QALY for treatment Genotype 1 and 1.2 QALY for genotypes 2 and 3. This past year 90 patients screened positive for Hepatitis C, of whom about 50 percent were treated. About 70 percent of the Hepatitis C clinic's patients are infected with Hepatitis C genotype 1.

[90 x 0.5 treated x 0.7 with genotype 1 x 0.43 QALY x $100,000 per QALY] + [90 x 0.5 x 0.3 with non G1 genotype x 1.17 QALY x ($100,000 per QALY = $2.9 million]

Step 9: General Medical Care. $5.8 million

Though Robin Hood funds only those parts of the clinic discussed above, an estimated 80 percent of patients who come through the asthma, cancer and hepatitis clinics also require additional medical care. We build in an estimate of the value of these referrals to general medical treatment. For general medical care the clinic sees 1470 patients.

[1,470 patients x 0.80 x 0.7 to account for referral rather than a direct intervention x 0.07 QALY per referral x $100,000 per QALY = $5.8 million]

Step 10: Present Discounted Value:

As above, present value is discounted at 5 percent with 3 percent real growth, with health-related benefits applied over a 65 year lifespan and earnings-related benefits assumed over a 30 year career. The average age of the children attending the asthma clinic is about 10 years old, and the average age of adult patients at the clinic is about 40.

| | |
|---|---|
| Asthma | |
| Increased earnings due to school attendance | $ 17,600 |
| Cancer | |
| None | |
| Hepatitis | |
| None | |
| Medical care referrals | $ 5.7 million |
| Total | $ 5.8 million |
| Total present value | $109 million |

Step 11: Robin Hood Factor = .04

Robin Hood grant $450,000
Total grantee cost = $12,000,000
RH factor = $450,000/ $12 million = 0.04

Step 12: Calculate benefits

| | |
|---|---|
| Present value total | $109 million |
| Asthma | |
| Initial screening | $ 775,000 |
| Intervention | $2,930,000 |
| Goods and services | $ 64,150 |
| Home assess/improve | $ 331,250 |
| Referral to obesity program | $ 17,892 |
| Referral to legal support | $ 23,800 |
| Referral for smoking cessation | $ 630,000 |
| Cancer Screenings | |
| Cancer screenings | $1,248,160 |
| Patient navigation | $ 474,301 |
| Hepatitis | |
| Hepatitis B | $11,340,000 |
| Hepatitis C | $ 2,934,000 |
| Grantee Total benefits | $130 million |

Step 13: Benefit/Cost ratio = 12:1

Robin Hood benefits = total grantee benefits x Robin Hood factor = $130 million x 0.04 = $5.2 million

RH benefits/RH costs = $5.2 million / $450,000 = 12

*Food metrics*

Robin Hood funds soup kitchens, food pantries and food-distribution grantees. We measure the benefits of our food groups by estimating:

1) the amount of money their visitors save by receiving free food rather than having to purchase food themselves – savings that the visitors can use to buy other life necessities;

2) the value of improved health from nutritious food provided by our emergency-food groups, measured in QALY's; and

3) the value of non-food services that food groups often provide visitors, including H.I.V. screenings; help signing up for food stamps and other government benefits; clean clothes; haircuts; homelessness-prevention services; medical, including mental-health referrals and services; mail services; medical services, mental-health services; and showers.

**Noodles**: example

Here we add the value of meals to the value of ancillary services that Noodles provides.

Step 1: Saving the price of a meal. $1.5 million

> We estimate the purchase price of a meal for low-income people in New York City at about $4.50. We base the figure on the Self-Sufficiency Standard for the City of New York 2004 (The Women's Center, 2004) and the U.S.D.A. (May 2006 Update to the Official U.S.D.A. Food Plans report, Low-cost plan). These figures take account of the city's cost of living. We note that meals at soup kitchens are commonly used as the main meal of the day for poor participants. Though there are arguments for valuing meals at soup kitchens differently from home-made meals, the presumed alternative for families served by Noodles. But the difference would almost certainly be small. Our research indicates that, in most cases, there are few opportunities for the families using Noodles to find nutritious food nearby. Thus, we treat (as counterfactual) that the entire value of the meals at Noodles represents a net gain to families – in Noodles absence, they would receive virtually none of the nutritious value.
>
> Noodles provided 325,000 meals across the contract year.
>
> [325,000 meals x $4.50 value per meal = $1.5 million]

Step 2: The additional value of nutrition. $12.7 million

> Food insufficiency creates health problems. Our consultants estimates that QALY's rise by about 3.5 percent for children who move from food-insufficient diets to food-sufficient diet, an estimates that holds after controlling for household income. (Casey et al, 2005).

Food from food pantries and soup kitchens remediates the impact of food insufficiency on health. We assume that one month of nutritious meals offsets previous food insufficiency. Thus, we assume that 90 meals close the 3.5 percent gap in QALY's. Said another way, each meal closes about 0.04 percent (3.5/90) of the gap in health due to food insufficiency – a health improvement that we attribute to Noodles.

[325,000 meals served x .04 percent QALY improvement due to 1 nutritious meal x $100,000 per QALY = $12.7 million]

Step 3: Clothing. $17, 000

Noodles provided about 1,770 items of clothing to visitors, 62 percent of whom were women, over the past year. Clothing values are averaged by gender at $12 for women and $16 for men. We estimate that about 30 percent of visitors would have found clothing in the absence of Noodle's gift.

[1,770 x 0.62 women x $12] + [1,770 x 0.38 men x $16 x 0.70] = $17,000

Step 4: Earned Income Tax Credit Referrals. $20,200

Noodles screened 321visitors for eligibility for tax refunds (under the E.I.T.C. provision of the tax code for low-paid workers). They collected a total of $29,000 in refunds. We assume that attribute 30 percent of the visitors would have retrieved their refunds in the absence of Noodles's program.

[$29,000 x 0.70 = $20, 200]

Step 5: Food stamp application assistance. $14, 000

Noodles records indicate an additional $14,000 in food stamps were received by visitors due to the food-stamp application assistance program. We attribute entire benefit to Noodles (none would have been tapped in the absence of Noodles's program).

Step 6: Haircuts. $12,600

Noodles provided 1,054 haircuts, valued at $12 each, to 420 people during the contract year. As above, the entire amount is attributed to Noodles.

[1,054 x $12 = $12,600]

Step 7: Homeless Prevention. $129,000

Noodles accommodated homeless men in a dormitory-style room, providing 1,333 bed-days. It also accommodated one couple in an efficiency apartment for 10 months.

We estimate the value of the bed-days at the rate paid by the city to house homeless individuals in city hotels - $90 per night. The apartment is valued at about $940 per month, based on the market value for low-income housing (www.huduser.org/datasets/fmr.html) in the city. Since there are few other opportunities for nightly shelter, the entire benefit that visitors receive is attributed to Noodles.

[(1,333 bed-days x $90) + ($940 x 10) = $129,000]

Step 8: Legal services. $370,000

Noodles reports that legal representation provided cash benefits to clients of about $370,000 (including making up about $40,000 in rent arrears for some of the visitors). As above, we assume the visitors would not have reaped these benefits in the absence of Noodles's program.

Step 9: Mail room / voicemail. $9,000

Noodles kept an average 25 active voicemail boxes and 400 active post office boxes this past contract year. We estimate that the voicemail service has a retail value of about $5 monthly (about $60 yearly), and we estimate the value of the mailboxes using the cost of the least expensive P.O. box at the United States Postal Service, $18 yearly (U.S.P.S.). We use these market prices to measure the benefit to the families because the money they save on these items can be used to buy other goods and services that they need. Note that these Noodles services are offered to clients who need to be in contact with a Noodles-related service or referral, and that there are additional benefits to having access to mail and messaging services, reflecting the broader benefit of communication, that are not included here. The entire amount is attributed to Noodles.

[25 voicemail boxes x $60] + [400 P.O. boxes x $18] = $9,000

Step 10: Medical Assessment. $990,000

Medical assessments were provided on site to 176 visitors, each valued at 0.07 QALY. While medical assessment and intervention is difficult for people in poverty to access, New York City does have the capacity to provide medical care for people in poverty. We estimate that about 20 percent of Noodles visitors would find medical care elsewhere if these services were not found at Noodles.

176 x 0.07 QALY per assessment x $100,000 per QALY x 0.80 percent of families who would not receive an assessment without Noodles) = $990,000

Step 11: Mental Health. $42,000

Noodles provided 13 visitors with mental health services by a licensed psychotherapist. We attribute 0.04 QALY to these mental health services. We assume that 20 percent of

the visitors to Noodles would have received these mental health services even if Noodles did not prove them.

[13 x 0.04 QALY per assessment x $100,000 per QALY x 0.80 = $42,000]

Step 12: Showers. $20,000

Noodles provided 2,213 showers, clean laundry and hygiene supplies to 275 people over the past contract year. Support for client's personal hygiene has been instituted at food sites because visitors need access and encouragement to use these services. Thus, we assume that visitors would not receive these services anywhere else, in the absence of Noodles's program. We estimate the value of these services by the cost of bathing supplies, water, a towel and one load of laundry at a laundromat.

Bathing supplies (soap, toothbrush and toothpaste, etc.) are valued at $4.30, twice the cost to Noodles (which gets a discount by purchasing in bulk).

Bathing supplies: 2,213 x $4.30 = $9,500

The cost to consumers of water can be estimated at 1 cent per gallon (United Water Annual Report of Water Quality, 2005), and a typical shower uses about 8 gallons per minute and lasts 15 minutes (Washington Suburban Sanitary Commission Water Usage Chart), about $1.20.

Water: 2,213 x $1.20 = $2,700

Towels are available at retail for $5.00 and we estimate one per person.

Towels: 275 shower takers x $5.00 = $1,400

The cost of laundry is estimated at $2.75 a load.

Laundry: 2,213 x $2.75 = $6,100

Present Discount Value for services provided over time

The value New York Noodle's services that result in improved quality of life across the lifetime are projected across the lifetime at a discount rate of 5 percent and a real growth of 3 percent. We estimate the average age of visitors to Noodles at 40 years old and we calculate returns until the visitor reaches age 55.

| | |
|---|---|
| Medical services | $985,600 |
| Present value of medical services | $12.3 million |

Benefits and Costs

| | |
|---|---|
| Present value of increased earnings | $12.3 million |
| Value of meals | $ 1.5 million |
| QALY's due to nutrition | $12.7 million |
| Clothing | $ 17,000 |
| EITC | $ 20,200 |
| Food stamps referral | $ 14,000 |
| Haircuts | $ 12,600 |
| Homeless prevention | $ 129,000 |
| Legal services | $ 366,000 |
| Mail room | $ 9,000 |
| Mental health support | $ 42,000 |
| Showers | $ 20,000 |
| Total grantee-provided benefits | $27 million |

Robin Hood factor = 12%

Robin Hood funding $300,000
Total grantee cost $2,500,000
RH factors = $300,000/$2.5 million = 0.12

Robin Hood benefits =

Total grantee benefits x RH factor = $27 million x 0.12 = $3.2 million

Benefit/Cost ratio = 11:1

Robin Hood benefits/Robin Hood cost = $3.2 million / $300,000 = 11

There are many program types that this overview does not review - syringe exchanges (swap clean for dirty needles from intravenous drug users), groups that help victims of domestic violence, emergency loan programs, many others. But we work up these programs like the ones detailed above. More important, none of these estimations are final. Each group's metrics is scrutinized and improved upon each renewal.

Appendix A: Estimating poverty multipliers

Here we present the results of analysis performed by Levine and Zimmerman for Robin Hood. They estimated four poverty multipliers from the information in the National Longitudinal Survey of Youth (NLSY):

I. Impact of test scores on high-school completion;
II. Impact of grades on adult earnings;
III. Impact of school absenteeism on future earnings; and
IV. Impact of grade repetition on adult earnings.

The NLSY provides a large data base of information about the survey participants, their children, and their parents. The table below presents those variables that are used to analyze the factors that affect a child's future earnings.

| **PARTICIPANT** | **CHILDREN** | **PARENTS** |
|---|---|---|
| Gender | Gender | Educational |
| Race/Ethnicity | Race/Ethnicity | Attainment |
| Age | Age | Family Structure |
| Birth Order | Birth Order | |
| Number of siblings | Peabody tests of reading and | |
| Number of children | math | |
| Age at birth of children | % of life that mother was | |
| Aptitude test score (AFQT) | married | |
| Educational attainment | Ave. annual family income since | |
| High school grades and | birth | |
| attendance | | |

Levine and Zimmerman used the NLSY data to estimate linear models (regression analysis). Specifically, they assumed that movements in each of the mother and children factors separately and independently affected the outcome variable: high school graduation or earnings (a rise in test scores is assumed to increase graduation rates or earnings). The statistical exercise yields estimates of the impact of movements in explanatory variables, like mother's income, on outcome variables, like adult earnings.

For readers without a statistical background, here's a basic explanation of what Levine and Zimmerman did and why they did it.

We seek to know the impact of childhood grades on future earnings. We care about this impact because we're hoping our education programs raise the grades of students and, by doing so, lead to opportunities that increase their future earnings.

We could try to capture the impact of grades on earnings by merely estimating the simple correlation between the two. But the simple correlation between grades and future earnings – a

measure of the extent to which kids with high grades are the same kids as those with high adult earnings – yields little usable information. Grades are correlated with mother's income – kids with high grades are often the kids of mothers with high income. So focusing on kids with high grades also means we're also focusing on kids with high incomes. So is the correlation between grades and future earnings because high grades lead to high-earning jobs, or because children of high-income parents get higher paying jobs?

To distinguish the separate, independent impact of several variables that are simultaneously at play, statisticians often result to so-called regression analysis. The following description is not statistically accurate. But for those without much statistics training, it should provide some useful intuition about what the regression results mean. Think of sifting through the entire sample of children in the NLSY and picking out those with the same scores on all the background variables under review. So in this sub-sample, you've picked out children whose mothers have approximately the same income, who share the same gender, who share the same ethnicity and so on. Indeed, the children in your sub-sample differ in only one interesting way: they have different test scores. Now, for this special sub-sample of children, look to see if the children with high grades also earn a lot as young adults, and if the children with lower grades generally earn less. If so, then the two variables are correlated even after removing the influence of extraneous factors like mother's income. In a very rough sense, think of the opaque notion of "regression" analysis as the creation of sub-samples of people who are virtually identical except on the one variable (in the above case, grades) of immediate interest. Regressions are nothing more than fancy correlations – estimated after subtracting out the impact of many background variables (above, mother's income) that are not the object of direct concern.

**Statistical Results**

*Poverty multiplier 1*: impact of test scores on high-school completion

Using data from 1,500 children of the original participants to estimate the following model:

HSG = A + B x Test Score + C x Mother variables + D x Child variables,

Where HSG = 1 if child graduates high school; zero otherwise, and
B = poverty multiplier, provided in table below

Table A1: Estimated Impact of a One Percentile Point Increase in Cognitive Test Scores on the Likelihood of High School Completion.
(standard deviation in parentheses)

| Average Score at: | Average across Tests | Math | Reading Recognition | Reading Comprehension |
|---|---|---|---|---|
| Age 5 to 14 | 0.441 | 0.387 | 0.307 | 0.375 |
| | (0.059) | (0.056) | (0.049) | (0.053) |
| Age 5 to 9 | 0.310 | 0.254 | 0.236 | 0.215 |
| | (0.064) | (0.058) | (0.055) | (0.055) |
| Age 10 to 14 | 0.428 | 0.376 | 0.267 | 0.354 |
| | (0.056) | (0.056) | (0.046) | (0.051) |

Notes: Each cell represents estimates from different regression model, which are multiplied by 100 so that they may be interpreted as a percentage effect. These estimates are obtained from regression models that also control for characteristics of the mother (age at birth of the child, educational attainment, aptitude/achievement test score, number of children, the fraction of the child's life the mother was married, and the log of the mother's average family income since the child was born) and of the child (birth order, whether or not the child was first born, gender, race, and ethnicity) Standard errors are adjusted to correct for heteroskedasticity.

Table A2: Estimated Impact of a One-Tenth Standard Deviation Increase in Cognitive Test Scores on the Likelihood of High School Completion.
(standard deviation in parentheses)

| Average Score at: | Average across Tests | Math | Reading Recognition | Reading Comprehension |
|---|---|---|---|---|
| Age 5 to 14 | 1.20 | 1.11 | 0.85 | 0.99 |
| | (0.17) | (0.17) | (0.14) | (0.16) |
| Age 5 to 9 | 0.85 | 0.74 | 0.65 | 0.58 |
| | (0.19) | (0.18) | (0.17) | (0.17) |
| Age 10 to 14 | 1.13 | 1.04 | 0.72 | 0.94 |
| | (0.17) | (0.15) | (0.13) | (0.15) |

On average, then, an education program that boosts a student's cognitive development score by ten percentile points (from 40$^{th}$ percentile to 50$^{th}$ percentile) would increase the probability of graduating high school by about 4 percent. Also from the above table, an education program that boosts a student's cognitive score by one tenth of a standard deviation would boost the probability of graduating high school by about one percent.

*Poverty multiplier 2*: impact of grades on adult earnings

Using data on 5,000 participants, aged 35 to 42, to estimate the following model:

Earnings= A + B x Grades + C x Participant variables +
D x Parent Variables

where B = poverty multiplier, provided in table below

Table A3: Impact of G.P.A. on Log Earnings

| | Demographic Control Variables |
|---|---|
| GPA | 0.113<br>(0.013) |

Note: Control variables include the respondent's race and age, whether or not his family lived in the south or in an urban area at age 14, years of parental education, number of siblings, the respondent's family structure while growing up, and whether the respondent's mother worked at age 14.

Thus, a one point increase in a student's high school grade point average (G.P.A.) increases wages by an average of 11 percent.

*Poverty multiplier 3*: impact of school absenteeism on adult earnings;

Earnings = A + B x Days Absent in $9^{th}$ Grade + C x Aptitude Score
+ D x other factors

where B = poverty multiplier

*Poverty multiplier 4*: impact of grade repetition on adult earnings.

Earnings = A + B x Behind Grade + C x Aptitude Score
+ D x other factors

Where, Behind grade if 14 in $7^{th}$ grade or lower; 15 in $8^{th}$ or lower;
or 16 in $9^{th}$ or lower
B = poverty multiplier

Table A4: Impact of Absenteeism and Grade Repetition on Log Earnings
(coefficients multiplied by 100, standard errors in parenthesis)

| | | Demographic Control Variables | |
|---|---|---|---|
| # Days Absent | | -0.22<br>(0.08) | |
| Behind Grade Level | | -.20.7<br>(5.57) | |

Note: Each cell represents results from a different regression model. Demographic control variables include the respondent's race, gender, and age, years of parental education, number of siblings, and the respondent's family structure while growing up.

For students for whom test scores are unavailable, a student who misses 10 more days of school – a large 0.7 standard deviation - lowers wages by about 2 percent (about $550 annually).

For students for whom test scores are unavailable, a student who falls behind grade level earns about 20 percent ($5,250) less per year.

Appendix B:

Predicting Earnings Increases from Contemporaneous Outcome Measures: A Multivariable Regression Approach

Index of Wage Effect Brought about by Improvements in Educational Outcomes

| Impact on Hourly Wage (in dollars) of a: | Point Estimate | Standard Error |
|---|---|---|
| Ten Percentile Increase in Test Score | 1.21 | 0.13 |
| One Point Increase in GPA (0 to 4 scale) | 1.84 | 0.36 |
| One Less Day Absent from School | -0.03 | 0.02 |
| Being at or above Grade Level for Age | 0.72 | 0.93 |
| Being At or Above Basic Reading Level | -0.39 | 0.61 |
| Completing High School | -0.12 | 0.65 |

Notes: Estimates based on data from the National Longitudinal Survey of Youth. The results are obtained from a regression model where the dependent variable is the individual's hourly wage and the independent variables include those reported along with the respondent's age, gender, race, parents' education, number of siblings, household structure at age 14 and a series of variables indicating whether or not any of the variables reported in the table have missing values. Being at or above grade level is defined based on the fact that 78 percent of $12^{th}$ grade students read at or above grade level based on results from the 1998 National Assessment of Educational Progress (NAEP). We used students' scores on a reading aptitude test and defined reading at grade level to be defined as being above the $22^{nd}$ percentile of this distribution.